

News of Spring

SPRING FLOWERS

News of Spring

And Other Nature Studies

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TRANSLATOR'S NOTE

Of the eight nature essays contained in this edition, the first, *Our City Gardens*, has hitherto appeared only in *The Daily Mail* and is now for the first time reprinted. The remainder form part of the two volumes entitled *The Measure of the Hours* and *The Double Garden*; and I have taken the opportunity not only of revising my translation with some thoroughness, but also of introducing all the additions and corrections which the author has made in the French edition of these two books, issued, in either case, after the publication of the first English version in America.

ALEXANDER TEIXEIRA DE MATTOS.

CHELSEA, 6 June, 1912.

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OUR CITY GARDENS

OUR CITY GARDENS

I

IN our large towns, most of the gardens made or rearranged within the last half century seem laid out on an unvarying plan. They all present the same winding paths, which turn upon themselves to lead nowhither, the inevitable lake, in a more or less drawn-out ellipse, the essential lawn, with the useless and obvious mounds and valleys, adorned at intervals with everlastingly oval flower-beds, while, here and there, an exotic plant, a palm, an araucaria or an aloe, stands chillily awaiting an uncertain ray of sunshine. All this is neither extremely ugly nor extremely displeasing, because nothing is quite ugly or displeasing in the world of plants and the most indifferent display of green is welcome to the eye of one who lives in a stone prison; and yet we are entitled to ask if these paltry and monotonous combinations really exhaust all the joys that the trees and flowers can give us.

2

In my opinion, the "landscape garden" or "English

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garden" which is thus abused is a great mistake on the part of our horticulturists. It is natural, it comes into being spontaneously, so to speak, when we can dispose of extensive spaces that mingle, in a country of hills and groves and rivers, with the surrounding landscape. It is then just that landscape itself, discreetly arranged and corrected "for the pleasure of the eyes." But it infallibly comes to look false and more or less absurd so soon as it aims at accumulating, in some poor enclosure, beauties which exist only by favour of the most serene lines of the horizon and which are nothing more than space harmoniously displayed. Let us not forget, besides, that the "English garden," which is natural or "sub-spontaneous," as the botanists say, in England, is rather, as we understand it, of Chinese origin and that there is no art nor taste more impenetrable and more hostile to our own than that of China.

3

The garden of the white races, at least the European garden, was always wiser and more logical. Go back as far as we may, we see it striving to adapt itself to the architectural schemes that surround it. It continues them, interprets and completes them. We are able, for instance, thanks to the

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paintings at Pompeii, nearly to reconstruct the Greek and Roman gardens:

“They consist,” says Gaston Boissier, “of regular paths, contained within two hedges of witch-elms and intersecting one another at right angles. In the centre is usually a sort of round space with a basin, in which swans float. Little green arbours have been contrived at intervals, formed of intertwined reeds and covered with vines; inside these, we see a marble column or a statue and benches placed all round for the convenience of strollers. The paintings remind one of that sentence of Quintilian’s which ingeniously expresses the taste of his time: ‘Is there anything more beautiful than a quincunx so arranged that, from whichever side we behold it, we see straight paths?’ ”

We find the same arrangement, more or less prominent according as it comes before or after the Renaissance, in all the Italian gardens; and Le Nôtre’s patterned flower-gardens but revived a tradition that had never quite died out. This tradition is significant. It was evidently born of a need of harmony inherent in our nature. It has always seemed to us

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necessary that that which surrounds our dwelling should partake, in some small measure, of its shape and its regularity. It has always struck us as disagreeable that the featureless plain or the unkempt forest should begin abruptly at our front-door or under our window-ledge. A transition was indispensable and naturally entailed the appropriation of the nearest plants and their submission to the symmetries of the building.

4

This transition, this traditional harmony, which has been deliberately disregarded in our towns since the excessive use of the small English garden,¹ is still found here and there in certain antiquated and almost dead cities, where perfect models survive of humanized walks and parks. I need not mention Versailles and other French gardens, whose sylvan decoration is so closely adapted to the buildings of the three Louis. Nor, by a stronger reason, need I recall the illustrious gardens of Italy, whose perfections are so manifest: they contain and continue their porticoes, columns and balustrades in so inseparable a fashion that this earth, perhaps, possesses nothing more satisfactory or more stately. But other instances, nearer at

¹ For observe that the small English garden, upon a pinch, can provide a setting, in the open country, for a rustic cottage, but does not harmonize with any other kind of dwelling.

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hand and not so splendid, are quite as topical. Carry back your mind to some little Dutch town, with its canals bordered by giant espaliered lime-trees and little red houses, gleaming with mirrors and brass. Think also of the Béguinage at Bruges, whose simple triangular lawn, planted with a few trees, or of the Petit Béguinage at Ghent, whose wide rectangular grassy spaces, lined with old elms and intersected at right angles by paths that lead to the church, offer the most persuasive examples of gardens in strict keeping with the appearance of the surrounding houses. At Ghent, in particular, the proof is the more striking inasmuch as the counter-proof is easily made. Go to the other end of the town, to what was once the Béguinage de Sainte-Élisabeth: it is now used for other purposes, but its general architecture has remained almost untouched. Though all the indented gables, all the little green doors of the convents, all those pleasant little pink-brick walls have remained faithful to their posts, the poor Béguinage is without soul, without features, without atmosphere, without style. Is this because of the departure of the béguines? Not at all: the little streets in this dying quarter are almost as deserted now as in the days when the pious sisters alone gave life to them with their long black

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veils. But, for the plain squares of grass, simple, primitive, immemorial and bordered with tall, straight poplars, the authorities have substituted a sort of vulgar and pretentious Parc Monceau, which would be lordly and is positively shabby. The necessary harmony between houses and trees has ceased to exist; and one of the most delightful memories of former days disappears with it.

You will find many other horticultural errors at Ghent, a city which has been too actively and somewhat recklessly tampered with. For instance, between Saint-Bavon and the Château de Gérard de Diable there is a fairly large open space, which the authorities have turned into the inevitable English square. The effect of its sickly, exotic and anomalous greenery against the austere and mighty background of the cathedral is childish beyond all dispute. Would not a humble grass-plot, planted with Lombardy poplars, have better respected the harmony that we expect to find between the stones and plants; or else the old-fashioned Flemish mall, peopled regularly with big, round, comely, bunchy lime-trees? These, moreover, do not in any way exclude floral ornamentation, provided that the latter follows the general and familiar movement of the grass and the shade.

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5

It will, perhaps, be said that this harmony is easy enough to realize when we have to do with styles of architecture so marked as are those of the French seventeenth- and eighteenth-century elevations or of the Dutch and Flemish houses. But, in the presence of our modern five- or six-storied buildings, in which all the styles mingle and clash, what relations are we to establish between their incessant contradictions and the unfortunate garden that has to agree with them? This is just the problem which people have hardly studied, which I do not pretend to solve, but to which I would simply call the attention of those who hold in their hands the grace, the beauty, the charm and the health of our large towns.

6

Everybody knows the Parc Monceau. In the eyes of many people, it constitutes the most perfect and luxurious type of the urban garden. Thanks to its extent, which is quite exceptional and but rarely found in the centre of a town, it shows us the English garden under its most advantageous and seductive aspect. There is no doubt that, with its cool lawns, its ornamental water, its elegant arcade, its wonderful flower-beds, its wide, undulating, sanded

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drives, with their glitter of carriages and cars, the Parc Monceau gives an undeniable impression of wealth, happiness and gaiety.

But let us make no mistake: it owes the best part of its attractions to its very dimensions. Reduce it to half its size and it will at once become paltry, while the suspicion is confirmed that fluttered through us from the first, namely, that all its surprising charm is rather artificial. It is a strange and unconvincing setting. It takes no account of the buildings that surround it nor of the style of the tall streets amongst which it opens. For the rest, this is the fault which we most readily forgive it; but it is guilty of an incomparably graver fault in fulfilling but two or three of its duties as a garden. It thinks only of making a vain-glorious display with lawns and walks that are almost bare. Now, in the desert of brick and stone, a garden should be not only a carpet of green velvet, but an oasis of coolness, silence and shade, things above all others dear and indispensable to the inhabitants of towns and obtainable only through the incessant, manifold, leafy intrusion of big trees.

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tween the French garden (that of the Tuileries, for instance), which conforms to the lines of certain streets, but is too bare and too sparingly shaded, and the English garden, which is also none too shady and which breaks up disagreeably the symmetry of our towns? If the Parc Monceau were planted with great clusters of elms, pines, limes, plane-trees or chestnut-trees, tall, close-set, dark, thick, almost cubical, and intersected by wide, clear-cut, regular avenues, all leading to a large lake, would it display to less advantage the luxury that drives through it and would it lose any of its charm for bestowing upon it some little air of gravity, peace and meditation?

What we can thus imagine in connection with the most successful of English gardens thrusts itself upon us with much greater cogency the moment we have to do with those little city parks the extent of which is no longer large enough to extenuate their absurdities. The great fault, the great mistake of all our municipal gardeners is their dread of the tree. They seem to forget that, at the bottom of man's heart, amid his obscurest, but most powerful instincts, reigns his boundless yearning for the primordial forest. You really abuse the innocence and the credulity of the town-dweller by offering

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him, instead of the heavy shadows for which his nature longs, paltry clumps of verdure, flowers in rows and worn-out grass that reminds him but too closely of the threadbare carpet of the bedroom whence he has just escaped in vain. A surface of a quarter of an acre thus arranged is nothing more than a wretched, dusty hearth-rug. Plant it with beautiful trees, not parsimoniously spaced, as though each of them were a bit of bric-à-brac on a tray of grass, but close together, like the ranks of a friendly army in order of battle. They will then act as they were wont to act in the native forest. Trees never feel themselves really trees nor perform their duty until they are there in numbers. Then, at once, everything is transformed: sky and light recover their first deep meaning, dew and shade return, peace and silence once more find a sanctuary.

8

One could vary the appearance of these refuges infinitely, according to the needs or counsels of the spot and the surroundings. Here, among these low houses, we would have a square of lime-trees, matronly, round and plump, placid, full-blown, imperturbably green and all

AN OLD GARDEN



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a-hum with bees. Yonder, where the house-fronts are richer and more regular, would be a square of chestnut-trees, whose opulent, heavy, thick, almost black tresses would droop to a man's height. Further still, among those pillared mansions, would stand an open space crowded with plane-trees; but I do not mean the plane-tree handled as we mishandle it in our northern countries, where we know nothing of its beauty. I mean the plane-tree of the towns and villages of the South, where they pollard it when it reaches twelve or fifteen feet in height. They thus obtain enormous, massive, thickset trunks, splendidly scaled with gold and oxydized copper, which, at one time, as in the Cours Mirabeau at Aix-en-Provence, dart forcibly towards the sky to create fairy-like plumed naves in the blue and, at another, as in the Allées d'Azémar at Draguignan, weave a low vault, magical and cool as a submarine grotto, through which the sun can hardly contrive to slip a stray crystal dart that breaks in dazzling shivers on the flagstones.

Let us not forget the hornbeam, which is so docile, nor its brother the elm, nor the beech: all three are ex-

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cellent for peopling a space in which the sky is free, that is to say, where we need not hesitate lest we should darken the windows of houses that are too near. Let us not forget either the Lombardy poplar, which is our cypress of the North and almost indispensable in our towns to mark a flight, here and there, towards space; besides, especially in our Flemish cities, we could hardly fill the poplar's place when it comes to bordering certain canals, marking the outline of a long meadow or guarding the entrance to an old house.

I will not concern myself with the acacia, formerly too much employed, which is frail, sickly and poor in leaf; nor with the oak, which is too slow, uncertain and unequal. But a tree which, to my mind, has been unjustly proscribed is the pine. I do not speak of the umbrella-pine, the noblest of the conifers and one of the purest glories of the world of plants. We must do without it, as without the cypress and the divine laurel-tree, in our northern cities, whose climate they could not support. The tree which I have in mind is the simple forest pine of our home woods. If you care to behold the effect which a square would produce planted exclusively with those wonderful trees, go to the country round Rouen, for instance, to the old forest domains of Bretonne or Roumare,

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and see the august fairy-scene enacted day and night in the heart of the spaces reserved to them. Whether it be under the sun or by moonlight, under the blazing rays of summer or the snows of winter, you can picture nothing to compare with the cathedral alignment of the innumerable shafts, shooting towards the sky, smooth, inflexible, pure, more tightly packed than the lictors' bundle and yet happy, independent and full of health and strength, from the warm and russet glow at their base to the blue, unreal, ethereal mist that crowns their top.

IO

Thus, in addition to the effective and necessary reminder of the forest, each of us, whether in the spacious mall or at the humble cross-roads, would find that quality of silence, perfume, meditation and shade which he prefers. There is, in fact, no lover of the great woods but knows that each group, each family of trees is mute in a different fashion and spreads a peace and a silence which we can recognize without having to raise our eyes; for the flavour of a shadow is as particular and pronounced as that of a ripe fruit.

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II

I notice, as I concludes these pages, that I have not spoken, as I intended to do, of the trees and shrubs with persistent leaves, the evergreens, as the English so aptly call them. Why have they been almost entirely neglected? Judiciously chosen, they might constitute the permanent delight of our cities burdened with six months of winter. The yew, for instance, is hardly to be found to-day. It is accounted, very wrongly, a sad and funereal tree, whereas I have so often seen it lend itself to the most harmonious and cheerful decorations! On the other hand, certain kinds of very robust laurels resist the worst frosts and keep up in December all the gladness and freshness of spring. Lastly, I should have liked to say a word on the plantations along our boulevards, so municipal, so contemptible, so sadly in keeping with the street-lamps, whereas one can imagine double and treble arches of foliage, magnificent summer bowers, leading to splashing fountains, to shimmering basins of light. But these points should form the object of a special study.

THE INTELLIGENCE OF THE FLOWERS

THE INTELLIGENCE OF THE FLOWERS

I

I WISH merely to recall here a few facts known to every botanist. I have made not a single discovery; and my modest contribution is confined to a few elementary observations. I need hardly say that I have no intention of reviewing all the proofs of intelligence which the plants give us. These proofs are innumerable and continual, especially among the flowers, in which the struggle of vegetable life towards light and understanding is concentrated.

Though there be plants and flowers that are awkward or unlucky, there is none that is wholly devoid of wisdom and ingenuity. All exert themselves to accomplish their work, all have the magnificent ambition to overrun and conquer the surface of the globe by endlessly multiplying that form of existence which they represent. To attain this object, they have, because of the law that chains them to the soil, to overcome difficulties much greater than those opposed to the increase of the animals. And therefore the majority of them have recourse to combinations, to mechanical contrivances, to traps,

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which, in regard to such matters as machinery, ballistics, aerial navigation and the observation of insects, have often anticipated the inventions and acquirements of man.

2

It would be superfluous once more to trace the picture of the great systems of floral fertilization: the play of stamens and pistil, the seduction of perfumes, the appeal of harmonious and dazzling colours, the concoction of nectar, which is absolutely useless to the flower and is manufactured only to attract and retain the liberator from without, the messenger of love—bee, humble-bee, fly, butterfly or moth—that shall bring to the flower the kiss of the distant, invisible, motionless lover. . . .

This vegetable world, which to us appears so placid, so resigned, in which all seems acquiescence, silence, obedience, meditation, is, on the contrary, that in which impatience, the revolt against destiny are the most vehement and stubborn. The essential organ, the nutrient organ of the plant, its root, attaches it indissolubly to the soil. If it be difficult to discover among the great laws that oppress us that which weighs heaviest upon our shoulders, in the case of the plant there is

SYCAMORE AND MOTHS



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no doubt: it is the law that condemns it to immobility from its birth to its death. Therefore it knows better than we, who disseminate our efforts, against what to rebel first of all. And the energy of its fixed idea, mounting from the darkness of the roots to become organized and fullblown in the flower, is an incomparable spectacle. It exerts itself wholly with one sole aim: to escape above from the fatality below, to evade, to transgress the heavy and sombre law, to set itself free, to shatter the narrow sphere, to invent or invoke wings, to escape as far as it can, to conquer the space in which destiny encloses it, to approach another kingdom, to penetrate into a moving and active world. . . . Is the fact that it attains its object not as surprising as though we were to succeed in living outside the time which a different destiny assigns to us or in making our way into a universe freed from the weightiest laws of matter? We shall see that the flower sets man a gigantic example of insubordination, courage, perseverance and ingenuity. If we had applied to the removal of various necessities that crush us, such as pain, old age and death, one half of the energy displayed by any little flower in our gardens, we may well believe that our lot would be very different from what it is.

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3

This need of movement, this craving for space, among the greater number of plants, is manifested in both the flower and the fruit. It is easily explained in the fruit, or, in any case, discloses only a less complex experience and foresight. Contrary to that which takes place in the animal kingdom and because of the terrible law of absolute immobility, the chief and worst enemy of the seed is the paternal stock. We are in a strange world, where the parents, unable to move from place to place, know that they are condemned to starve or stifle their offspring. Every seed that falls at the foot of the tree or plant is either lost or doomed to sprout in wretchedness. Hence the immense effort to throw off the yoke and conquer space. Hence the marvellous systems of dissemination, of propulsion, of navigation of the air which we find on every side in the forest and the plain: among others, to mention, in passing, but a few of the most curious, the aerial screw or samara of the Maple; the bract of the Lime-tree; the flying-machine of the Thistle, the Dandelion and the Salsify; the detonating springs of the Spurge; the extraordinary squirt of the Momordica; the hooks of the eriophilous plants; and a thousand other unexpected and astounding pieces of mech-

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anism; for there is not, so to speak, a single seed but has invented for its sole use a complete method of escaping from the maternal shade.

It would, in fact, be impossible, if one had not practised a little botany, to believe the expenditure of imagination and genius in all the verdure that gladdens our eyes. Consider, for instance, the pretty seed-pipkin of the Scarlet Pimpernel, the five valves of the Balsam, the five bursting capsules of the Geranium. Do not forget, upon occasion, to examine the common Poppy-head, which we find at any herbalist's. This good, big head shelters a prudence and a foresight that deserve the highest praise. We know that it holds thousands of tiny black seeds. Its object is to scatter this seed as dexterously and to as great a distance as possible. If the capsule containing it were to split, to fall or to open underneath, the precious black dust would form but a useless heap at the foot of the maternal stalk. But its only outlet is through apertures contrived right at the top of the capsule, which, when ripe, bends over on its peduncle, sways like a censer at the least breath of wind and literally sows the seeds in space, with the very action employed by the sower.

Shall I speak of the seeds which provide for their dissemi-

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nation by birds and which, to entice them, as in the case of the Mistletoe, the Juniper, the Mountain-ash, lurk inside a sweet husk? We see here displayed such a powerful reasoning faculty, such a remarkable understanding of final causes that we hardly dare dwell upon the subject, for fear of repeating the ingenuous mistakes of Bernardin de Saint-Pierre. And yet the facts can be no otherwise explained. The sweet husk is of no more use to the seed than the nectar, which attracts the bees, is to the flower. The bird eats the fruit because it is sweet and, at the same time, swallows the seed, which is indigestible. He flies away and, soon after, ejects the seed in the same condition in which he has received it, but stripped of its case and ready to sprout far from the attendant dangers of its birthplace.

4

But let us return to simpler contrivances. Pluck a blade of grass by the roadside, from the first tuft that offers, and you will perceive an independent, indefatigable, unexpected little intelligence at work. Here, for instance, are two poor creeping plants which you have met a thousand times on your walks, for we find them in every spot, down to the most

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ungrateful corners to which a pinch of mould has strayed. They are two varieties of wild Lucern or Medick (*Medicago*), two "ill weeds" in the humblest sense of the word. One bears a reddish flower, the other a little yellow ball the size of a pea. To see them crawling and hiding among the proud grasses, one would never suspect that, long before the illustrious geometrician and chemist of Syracuse, they had discovered the Archimedean screw and endeavoured to apply it not to the raising of liquids, but to the art of flying. They lodge their seeds in delicate spirals, with three or four convolutions, admirably constructed to delay their fall and, consequently, with the help of the wind, to prolong their journey through the air. One of them, the yellow, has even improved upon the apparatus of the red by furnishing the edges of the spiral with a double row of spikes, with the evident intention of hooking it, on its passage, to either the clothes of the pedestrians or the fleece of the animals. It clearly hopes to add the advantages of eriophily—that is to say the dissemination of seed by sheep, goats, rabbits and so on—to those of anemophily, or dissemination by the wind.

The most touching side of this great effort is its futility. The poor red and yellow Lucerns have blundered. Their re-

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markable screws are of no use to them: they could act only if they fell from a certain height, from the top of some lofty tree or tall *Graminea*; but, constructed as they are on the level of the grass, they have hardly taken a quarter of a turn before already they touch the ground. We have here a curious instance of the mistakes, the gropings, the experiments and the frequent little miscalculations of nature; for only those who have studied nature but very little will maintain that she never errs.

Let us observe, in passing, that other varieties of the Lucern (not to speak of the Clover, another papilionaceous *Leguminosa*, almost identical with that of which we are now speaking) have not adopted this flying apparatus, but keep to the primitive methods of the pod. In one of them, the *Medicago aurantiaca*, we very clearly perceive the transition from the twisted pod to the screw. Another variety, the *Medicago scutellata*, or Snail-medick, rounds its screw in the form of a ball and so on. It would seem, therefore, that we are assisting at the fascinating spectacle of a sort of work of invention, at the attempts of a family that has not yet settled its destiny and is seeking for the best way to ensure its future. Was it not, perhaps, in the course of this search that, having

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been deceived in the spiral, the yellow Lucern added spikes or hooks to it, saying to itself, not unreasonably, that, since its leaves attract the sheep, it is inevitable and right that the sheep should assume the care of its progeny? And, lastly, is it not thanks to this new effort and to this happy thought that the Lucern with the yellow flowers is infinitely more widely distributed than its sturdier cousin whose flowers are red?

5

It is not only in the seed or the flower, but in the whole plant, leaves, stalks and roots, that we discover, if we stoop for a moment over their humble work, many traces of a prudent and quick intelligence. Think of the magnificent struggle towards the light of the thwarted branches, or the ingenious and courageous strife of trees in danger. As for myself, I shall never forget the admirable example of heroism given me the other day in Provence, in the wild and delightful Gorges du Loup, all fragrant with violets, by a huge, centenarian Laurel-tree. It was easy to read on its twisted and, so to speak, writhing trunk the whole drama of its hard and tenacious life. A bird or the wind, masters of destiny both, had carried the seed to the flank of the rock, which was as

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perpendicular as an iron curtain; and the tree was born there, two hundred yards above the torrent, inaccessible and solitary, among the burning and barren stones. From the first hour, it had sent its blind roots on a long and painful search for precarious water and soil. But this was only the native anxiety of a species that knows the aridity of the South. The young stem had to solve a much graver and more unexpected problem: it started from a vertical plane, so that its top, instead of rising towards the sky, bent down over the gulf. It was obliged, therefore, notwithstanding the increasing weight of its branches, to correct the first flight, stubbornly to bend its disconcerted trunk in the form of an elbow close to the rock and thus, like a swimmer who throws back his head, by means of incessant will-power, tension and contraction to hold its heavy crown of leaves straight up into the sky.

Thenceforward, all the preoccupations, all the energy, all the free and conscious genius of the plant had centred around that vital knot. The monstrous, hypertrophied elbow revealed, one by one, the successive solitudes of a kind of thought that knew how to profit by the warning which it received from the rains and the storms. Year by year, the leafy dome grew heavier, with no other care than to expand in the

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light and heat, while a hidden canker gnawed deep into the tragic arm that supported it in space. Then, obeying I know not what instinctive promptings, two stout roots, two fibrous cables, issuing from the trunk at more than two feet above the elbow, had come to moor it to the granite wall. Had they really been evoked by the tree's distress or were they perhaps waiting providently, from the first day, for the acute hour of danger, in order to increase the value of their assistance? Was it only a happy accident? What human eye will ever assist at these silent dramas, which are all too long for our brief lives? ¹

6

Among the vegetals that give the most striking proofs of intelligence and initiative, the plants which might be described as "animated" or "sentient" deserve to be studied in detail. I will do no more than recall the delightful tremors of the Sensitive-plant, the shrinking Mimosa with which we

¹ Let us compare with this the act of intelligence of another root, whose exploits are related by Brandis in his *Ueber Leben und Polarität*. In penetrating into the earth, it had come upon an old boot-sole in order to cross this obstacle, which, apparently, the root was the first of its kind to meet upon its road, it subdivided itself into as many parts as there were holes made in the sole by the cobbler's awl; then, when the obstacle was overcome, it joined together and once more united all its divided radicles into a single homogeneous tap-root.

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are all acquainted. There are other herbs endowed with spontaneous movements that are not so well-known, notably the *Hedysarea*, among which the *Hedysarum gyrans*, or Moving-plant, behaves in the most restless and surprising fashion. This little *Leguminosa*, which is a native of Bengal, but often cultivated in our hothouses, performs a sort of perpetual and intricate dance in honour of the light. Its leaves are divided into three folioles, one wide and terminal, the two others narrow and planted at the base of the first. Each of these leaflets is animated with a different movement of its own. They live in a state of rhythmical, almost chronometrical and continuous agitation. They are so sensitive to light that their dance flags or quickens according as the clouds veil or uncover that corner of the sky which they contemplate. They are, as we see, real photometers; and this long before Crook's discovery of the natural otheoscopes.

7

But these plants, to which should be added the *Droseras*, the *Dionæas* and many others, are nervous plants that already go a little beyond the mysterious and probably imaginary ridge that separates the vegetable from the animal kingdom. It is

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not necessary to seek so high; and we find as much intelligence and almost as much visible spontaneity at the other end of the world which we are considering, in the shallows where the plant is hardly to be distinguished from clay or stone. We have here the fabulous class of the *Cryptogamia*, which can be studied only under the microscope, for which reason we will pass it by in silence, although the work of the sporules of the Mushrooms, Ferns and Horse-tails is incomparable in its delicacy and ingenuity. But, among the aquatic plants, the inhabitants of the original ooze and mud, we can see less secret marvels performed. As the fertilization of their flowers cannot be effected under water, each of them has thought out a different system to allow of the dry dissemination of the pollen. Thus, the *Zosteras*, that is to say, the common Sea-wrack with which we stuff our bedding, carefully enclose their flower in a regular diving-bell; and the Water-lilies send theirs to blossom on the surface of the pond, supporting and feeding it at the top of an endless stalk, which lengthens as the level of the water rises. The *Villiersia nymphoides*, having no expanding stalk, simply releases its flowers, which rise and burst like bubbles. The *Trapa natans*, or Water-caltrop, supplies them with a sort of inflated bladder: they shoot up and

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open. Then, when the fertilization is accomplished, the air in the bladder is replaced by a mucilaginous fluid, heavier than the water, and the whole apparatus sinks back again to the slime in which the fruits will ripen.

The method of the *Utricularia* is even more complicated. M. Henri Bocquillon describes it in his *Vie des Plantes*:

“These plants, which are common in ponds, ditches, pools and the puddles of peat-bogs, are not visible in winter, when they lie on the mud. Their long, slim, trailing stalk is furnished with leaves reduced to ramified filaments. At the axilla of the leaves thus transformed, we see a sort of little pyriform pocket with an aperture at its pointed upper end. This aperture has a valve, which can be opened only from the outside inwards; its edges are provided with ramified hairs; the inside of the pocket is covered with other little secretory hairs which give it the appearance of velvet. When the moment of efflorescence has come, the axillary utricles fill with air: the more this air tends to escape, the more tightly it closes the valve. The result is that it imparts a great specific buoyancy to the plant and carries it to the surface of the water. Not till then do those charming little yellow flowers come into

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blossom, resembling quaint little mouths with more or less swollen lips and palates streaked with orange or rust-red lines. During the months of June, July and August, they display their bright colours amid the vegetable decay around them, while rising gracefully above the muddy water. But fertilization has been effected, the fruit develops, the action is reversed: the ambient water presses upon the valve of the utricles, forces it in, rushes into the cavity, weighs down the plant and compels it to descend to the mud again."

Is it not interesting to see thus gathered in this immemorial little apparatus some of the most fruitful and most recent human inventions: the play of valves or plugs, the pressure of fluids and the air, the Archimedean principle studied and turned to account? As the author whom we have just quoted observes, "the engineer who first attached a rafting apparatus to a sunken ship little thought that a similar process had been in use for thousands of years." In a world which we believe unconscious and destitute of intelligence, we begin by imagining that the least of our ideas creates new combinations and relations. When we come to look into things more closely, it appears infinitely probable that it is impossible for us to create

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anything whatsoever. We are the last comers on this earth, we simply find what has always existed and, like wonderstruck children, we travel again the road which life had travelled before us. For that matter, it is very natural and comforting that this should be so. But we will return to this point.

8

We must not leave the aquatic plants without briefly mentioning the life of the most romantic of them all: the legendary *Vallisneria*, an hydrocharad whose nuptials form the most tragic episode in the love-history of the flowers. The *Vallisneria* is a rather insignificant herb, possessing none of the strange grace of the Water-lily or of certain submersed verdant tresses. But it would seem as though nature had delighted in imbuing it with a beautiful idea. Its whole existence is spent at the bottom of the water, in a sort of half-slumber, until dawns the wedding-hour, when it aspires to a new life. Then the female plant slowly uncoils its long peduncular spiral, rises, emerges and floats and blossoms on the surface of the pond. From a neighbouring stem, the male flowers, which see it through the sunlit water, rise in their turn, full of hope, towards the one that rocks, that awaits them,

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that calls them to a fairer world. But, when they have come half-way, they feel themselves suddenly held back: their stalk, the very source of their life, is too short; they will never reach the abode of light, the only spot in which the union of the stamens and the pistil can be achieved!

Is there any more cruel inadvertence or ordeal in nature? Picture the tragedy of that longing, the inaccessible so nearly attained, the transparent fatality, the impossible with not a visible obstacle! . . . It would be insoluble, like our own tragedy upon this earth, were it not that an unexpected element is mingled with it. Did the males foresee the disappointment with which they would meet? One thing is certain, that they have locked in their hearts a bubble of air, even as we lock in our souls a thought of desperate deliverance. It is as though for a moment they hesitated; then, with a magnificent effort, the finest, the most supernatural that I know of in all the pageantry of the insects and the flowers, in order to rise to happiness they deliberately break the bond that attaches them to life. They tear themselves from their stalk and, with an incomparable flight, amid bubbles of gladness, their petals dart up and break the surface of the water. Wounded to death, but radiant and free, they float

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for a moment beside their heedless brides and the union is accomplished, whereupon the victims drift away to perish, while the wife, already a mother, closes her corolla, in which lives their last breath, rolls up her spiral and descends to the depths, there to ripen the fruit of the heroic kiss.

Must we spoil this charming picture, which is strictly accurate, but seen from the side of the light, by looking at it also from the shadow? Why not? There are sometimes on the shady side truths quite as interesting as those on the bright. This delightful tragedy is perfect only when we consider the intelligence and the aspirations of the species. But, when we observe the individuals in this ideal plan, we shall often see them act awkwardly and without rhyme or reason. At one time, the male flowers will ascend to the surface when there are not yet any pistilled flowers near. At another, when the low water would permit them easily to join their companions, they will nevertheless mechanically and needlessly break their stalks. We here once more establish the fact that all genius lies in the species, in life or in nature, whereas the individual is nearly always stupid. In man alone does a real emulation exist between the two intelligences, a more and more precise, more and more active tendency to-

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wards a sort of equilibrium which is the great secret of our future.

9

The parasitic plants, again, present a curious and crafty spectacle, as in the case of that astonishing *Cuscuta* commonly called the Dodder. It has no leaves; and no sooner has its stalk attained a few inches in length than it voluntarily abandons its roots to twine about its chosen victim, into which it digs its suckers. Thenceforth, it lives exclusively upon its prey. Its perspicacity is not to be deceived; it will refuse any support that does not please it and will go some distance, if necessary, in search of the stem of Hemp, Hop, Lucern or Flax that suits its temperament and its taste.

This *Cuscuta* naturally calls our attention to the Creepers, which have very remarkable habits and which deserve a word to themselves. Those of us who have lived a little in the country have often had occasion to admire the instinct, the sort of power of vision, that directs the tendrils of the Virginia Creeper or the *Convolvulus* towards the handle of a rake or spade leaning against a wall. Move the rake and, the next day, the tendril will have turned completely round

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and found it again. Schopenhauer, in his treatise *Ueber den Willen in der Natur*, in the chapter devoted to the physiology of plants, recapitulates on this point and on many others a host of observations and experiments which it would take too long to set out here. I therefore refer the reader to this chapter, where he will find numerous sources and references mentioned. Need I add that, in the past sixty or seventy years, these sources have been strangely multiplied and that, moreover, the subject is almost inexhaustible?

Among so many different inventions, artifices and precautions, let us quote also, by way of example, the foresight displayed by the *Hyoseris radiata*, or Starry Swine's-succory, a little yellow-flowered plant, not unlike the Dandelion and often found on old walls along the Riviera. In order to ensure both the dissemination and the stability of its race, it bears at one and the same time two kinds of seeds: the first are easily detached and are furnished with wings wherewith to abandon themselves to the wind, while the others have no wings, remain captive in the inflorescence and are set free only when the flowers decay.

The case of the *Xanthium spinosum*, or Spiny Xanthium, shows us how well-conceived and effective certain systems of

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dissemination can be. This *Xanthium* is a hideous weed, bristling with savage prickles. Not long ago, it was unknown in Western Europe and no one, naturally, had dreamt of acclimatizing it. It owes its conquest to the hooks which finish off the capsules of its fruits and which cling to the fleece of the animals. A native of Russia, it came to us in bales of wool imported from the distant steppes of Muscovy; and one might follow on the map the stages of this great emigrant which has annexed a new world.

The *Silene Italica*, or Italian Catchfly, a simple little white flower, found in abundance under the olive-trees, has set its thought working in another direction. Apparently very timorous, very susceptible, to avoid the visits of importunate and indelicate insects it furnishes its stalks with glandular hairs, whence oozes a viscid fluid in which the parasites are caught with such success that the peasants of the South use the plant as a fly-catcher in their houses. Certain kinds of Catchflies, moreover, have ingeniously simplified the system. Dreading the ants in particular, they discovered that it was enough to place a wide viscid ring under the node of each stalk in order to ward them off. This is exactly what our gardeners do when they draw a circle of tar around the

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trunk of the apple-trees to stop the ascent of the caterpillars.

This leads to the study of the defensive means employed by the plants. In an excellent popular work, *Les Plantes originales*, to which I refer the reader who wishes for fuller details, M. Henri Coupin examines some of these quaint and startling weapons. We have first the captivating question of the thorns, concerning which M. Lothelier, a student at the Sorbonne, has made a number of interesting experiments, resulting in the conclusion that shade and damp tend to suppress the prickly parts of the plants. On the other hand, whenever the place in which it grows is dry and scorched by the sun, the plant bristles and multiplies its spikes, as though it felt that, as almost the sole survivor among the rocks or in the hot sand, it is called upon to make a mighty effort to redouble its defences against an enemy that no longer has a choice of victims to prey upon. It is a remarkable fact, moreover, that, when cultivated by man, most of the thorny plants gradually lay aside their weapons, leaving the care of their safety to the supernatural protector who has adopted them in his fenced grounds.¹

¹ Among the plants that have ceased to defend themselves, the most striking case is that of the Lettuce:

"In its wild state," says the above-mentioned author, "if we break a stalk or a leaf, we see a white juice exude from it, the *latex*, a substance formed of different mat-

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Certain plants, among others the *Boragineæ*, supply the place of thorns with very hard bristles. Others, such as the Nettle, add poison. Others, the Geranium, the Mint, the Rue, steep themselves in powerful odours to keep off the animals. But the strangest are those which defend themselves mechanically. I will mention only the Horsetail, which surrounds itself with a veritable armour of microscopic grains of *silex*. Moreover, almost all the *Gramineæ*, in order to discourage the gluttony of the slugs and snails, add lime to their tissues.

IO

Before entering upon the study of the complicated forms of apparatus rendered necessary by cross-fertilization, among the thousands of nuptial ceremonies that prevail in our gardens let us mention the ingenious ideas of some very simple

ters which vigorously defend the plant against the attacks of the slugs. On the other hand, in the cultivated species derived from the former, the *latex* is almost missing, for which reason the plant, to the despair of the gardeners, is no longer able to resist and allows the slugs to eat it."

It is nevertheless right to add that this *latex* is rarely lacking except in the young plants, whereas it becomes quite abundant when the Lettuce begins to "cabbage" and when it runs to seed. Now it is at the commencement of its life, at the budding of its first, tender leaves, that the plant most needs to defend itself. One is inclined to think that the cultivated Lettuce loses its head a little, so to speak, and no longer knows exactly where it stands.

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flowers, in which the grooms and brides are born, love and die in the same corolla. The characteristics of the system are well enough known: the stamens, or male organs, generally frail and numerous, are grouped around the robust and patient pistil. As the great Linnæus so delightfully says, "*Mariti et uxores uno eodemque thalamo gaudent.*" But the distribution, the form, the habits of these organs vary in every flower, as though nature had a thought that cannot yet become settled, or an imagination that makes it a point of honour never to repeat itself. Often the pollen, when ripe, falls quite naturally from the top of the stamens upon the pistil; but very often, also, pistil and stamens are of the same height, or the latter are too far away, or the pistil is twice as tall as they. Then come endless efforts to succeed in meeting. Sometimes, as in the Nettle, the stamens crouch upon their stalk at the bottom of the corolla: at the moment of fertilization, the stalk straightens out like a spring; and the anther, or pollen mass, that tops it shoots a cloud of dust over the stigma. Sometimes, as in the Barberry, whose nuptials can be accomplished only in the bright hours of a cloudless day, the stamens, far removed from the pistil, are kept against the sides of the flower by the weight of their moist glands:

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the sun appears and evaporates the fluid and the unballasted stamens dart upon the stigma. Elsewhere are different things again: thus, in the Primroses, the females are by turns longer and shorter than the males. In the Lily, the Tulip and other flowers, the too-lanky bride does the best she can to gather and fix the pollen. But the most original and fantastic system is that of the Rue (*Ruta graveolens*), a rather evil-smelling medicinal herb of the ill-famed emmenagogic tribe. The peaceful and docile stamens, drawn up in a circle around the fat, squat pistil, wait expectant in the yellow corolla. At the conjugal hour, obeying the command of the female, which apparently gives a sort of call by name, one of the males approaches and touches the stigma. Then come the third, the fifth, the seventh, the ninth male, until the whole row of odd numbers has rendered service. Next, in the even ranks, comes the turn of the second, the fourth, the sixth and so on. This is indeed love to order! This flower which knows how to count appears to me so extraordinary that I at first refused to believe the botanists; and I was determined to test its numerical sense more than once before accepting it. I have ascertained positively that it but seldom makes a mistake.

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It were wearisome to multiply these instances. A stroll in the woods or fields will allow any one to make a thousand observations in this direction, each quite as curious as those related by the botanists. But, before closing this chapter, I would mention one more flower: not that it displays any remarkable imagination, but because of the delightful and easily-perceptible grace of its amorous movement. I allude to the *Nigella Damascena*, or Fennel-flower, whose folk-names are charming: Love-in-a-mist, Devil-in-a-bush, Ragged-lady; so many happy and touching efforts of popular poetry to describe a little flower that pleases it. This plant is found in a wild state in the South, by the roadside and under the olive-trees, and is often cultivated in the North in old-fashioned gardens. Its blossom is a pale blue, simple as a floweret in a primitive painting, and the "Venus' locks" or "ragged locks" that give the Ragged-lady its popular name in France are the light, tenuous, tangled leaves that surround the corolla with a "bush" of misty verdure. At the base of the flower, the five extremely long pistils stand close-grouped in the centre of the azure crown, like five queens clad in green robes, haughty and inaccessible. Around them crowd hopelessly the innumerable throng of their lovers, the stamens, which do not come up to

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their knees. And now, in the heart of this palace of sapphires and turquoises, in the gladness of the summer days, begins the drama without words or catastrophe which one might expect, the drama of powerless, useless, motionless waiting. But the hours pass that are the flower's years: its brilliancy fades, its petals fall and the pride of the great queens seems at last to bend under the weight of life. At a given moment, as though obeying the secret and irresistible command of love, which deems the proof to have lasted long enough, with a concerted and symmetrical movement, comparable with the harmonious curves of a fountain with five jets, they all bend backwards together, stoop and gracefully cull the golden dust of the nuptial kiss on the lips of their humble lovers.

II

The unexpected abounds here, as we see. A bulky volume might be written on the intelligence of the plants, even as Romanes wrote one on animal intelligence. But this sketch has no pretension to become a manual of that kind; and I wish only to call attention to a few interesting events that happen beside us in this world wherein we think ourselves, a little too vaingloriously, privileged. These events are not selected, but

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taken by way of instances, as the random result of observation and circumstance. I propose, however, in these short notes, to concern myself above all with the flower, for it is in the flower that the greatest marvels shine forth. I set aside, for the moment, the carnivorous flowers, *Droseras*, *Nepenthes* and the rest, which verge upon the animal kingdom and would demand a special and expansive study, in order to devote myself to the true flower, the flower proper, which is believed to be insentient and inanimate.

To separate facts from theories, let us speak of the flower as though it had foreseen and conceived all that it has realized, after the manner of men. We shall see later how much we must concede to it, how much deny it. For the present, let it take the stage alone, like a splendid princess endowed with reason and will. There is no denying that it appears to be provided with both; and to deprive it of either we should have to resort to very obscure hypotheses. It is there, then, motionless on its stalk, sheltering in a dazzling tabernacle the reproductive organs of the plant. Apparently, it has but to allow the mysterious union of the stamens and pistil to be consummated in this tabernacle of love. And many flowers do so consent. But to many others there is propounded, big

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with awful threats, the normally insoluble problem of cross-fertilization. As the result of what numberless and immemorial experiments did they observe that self-fertilization—that is the fertilization of the stigma by the pollen falling from the anthers that surround it in the same corolla—rapidly induces the degeneration of the species? They have observed nothing, we are told, nor profited by any experience. The force of things, quite simply and little by little, eliminated the seeds and plants weakened by self-fertilization. Soon, only those survived which, through some anomaly, such as the exaggerated length of the pistil, rendering it inaccessible to the anthers, were prevented from fertilizing themselves. These exceptions alone endured, through a thousand accidents; heredity finally determined the work of chance; and the normal type disappeared.

12

We shall see presently what light these explanations afford. For the moment, let us stroll into the garden or the field, to study more closely two or three curious inventions of the genius of the flower. And already, without going far from the house, we have here, frequented by the bees, a

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sweet-scented cluster inhabited by a most skilled mechanic. There is no one, even among the least countrified, but knows the good Sage. It is an unpretending *Labiata* and bears a very modest flower, which opens violently, like a hungry mouth, to snatch the passing rays of the sun. For that matter, it presents a large number of varieties, not all of which—this is a curious detail—have adopted or carried to the same pitch of perfection the system of fertilization which we are about to examine. But I am concerned here only with the most common Sage, that which, at this moment, as though to celebrate spring's passage, covers with violet draperies all the walls of my terraces of olive-trees. I assure you that the balconies of the great marble palaces that await the kings were never more luxuriously, more happily, more fragrantly adorned. One seems to catch the very perfumes of the light of the sun at its hottest, when the noon of day strikes. . . .

To come to details, the stigma, or female organ, of the flower is contained in the upper lip, which forms a sort of hood, wherein are also the two stamens, or male organs. To prevent these from fertilizing the stigma which shares the same nuptial tent, this stigma is twice as long as they, so that they have no hope of reaching it. Moreover, in order to

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avoid any accident, the flower has made itself protenandrous, that is to say, the stamens ripen before the pistil, so that, when the female is fit to conceive, the males have already disappeared. It is necessary, therefore, that some outside power should intervene and accomplish the union by carrying a foreign pollen to the abandoned stigma. A certain number of flowers, the anemophilous flowers, leave this care to the wind. But the Sage—and this is the more general case—is entomophilous, that is to say, it loves insects and relies upon their collaboration alone. Still, it is quite aware, for it knows many things, that it lives in a world where it is best to expect no sympathy, no charitable aid. It does not waste time, therefore, in making useless appeals to the courtesy of the bee. The bee, like all that struggles against death in this world of ours, exists only for herself and for her kind and is in no way concerned to render a service to the flowers that feed her. How, then, shall she be made in spite of herself, or at least unconsciously, to fulfil her matrimonial office? Observe the wonderful love-trap contrived by the Sage: right at the back of its tent of violet silk, it distils a few drops of nectar; this is the bait. But, barring the access to the sugary fluid, stand two parallel stalks, somewhat similar to the uprights of a Dutch

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drawbridge. Right at the top of each stalk is a great sack, the anther, overflowing with pollen; at the bottom, two smaller sacks serve as a counterpoise. When the bee enters the flower, in order to reach the nectar she has to push the small sacks with her head. The two stalks, which turn on an axis, at once topple over and the upper anthers come down and touch the sides of the insect, whom they cover with fertilizing dust. No sooner has the bee departed than the pivot-springs fly back and replace the mechanism in its first position; and all is ready to repeat the work at the next visit.

However, this is only the first half of the play: the sequel is enacted in another scene. In a neighbouring flower, whose stamens have just withered, enters upon the stage the pistil that awaits the pollen. It issues slowly from the hood, lengthens out, stoops, curves down, becomes forked so as, in its turn, to bar the entrance to the tent. As the bee goes to the nectar, her head passes freely under the hanging fork, which, however, grazes her back and sides exactly at the spots touched by the stamens. The two-cleft stigma greedily absorbs the silvery dust; and impregnation is accomplished. It is easy, for that matter, by introducing a straw or the end of a match, to set the apparatus going and to take stock of the striking

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and marvellous combination and precision of all its movements.

The varieties of the Sage are very many—they number about five hundred—and I will spare you the greater part of their scientific names, which are not always pretty: *Salvia pratensis*, *officinalis* (our Garden Sage), *Horminum*, *Horminoides*, *glutinosa*, *Sclarea*, *Roemerii*, *azurea*, *Pitcheri*, *splendens* (the magnificent Sage of our flower-beds) and so on. There is not, perhaps, one but has modified some detail of the machinery which we have just examined. A few—and this, I think, is a doubtful improvement—have doubled and sometimes trebled the length of the pistil, so that it not only emerges from the hood, but makes a wide plumelike curve in front of the entrance to the flower. They thus avoid the just-possible danger of the fertilization of the stigma by the anthers dwelling in the same hood; but on the other hand, it may happen, if the protenandry be not strict, that the insect, on leaving the flower, deposits on the stigma the pollen of the very anthers with which the stigma cohabits. Others, in the movement of the lever, make the anthers diverge farther apart, so as to strike the sides of the animal with greater precision. Others, lastly, have not succeeded in arranging and adjusting every

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part of the mechanism. I find, for instance, not far from my violet Sages, near the well, under a cluster of Oleanders, a family of white flowers tinted with pale lilac which have no suggestion or trace of a lever. The stamens and the stigma are heaped up promiscuously in the middle of the corolla. All seems left to chance and disorganized.

I have no doubt that it would be possible, to any one collecting the very numerous varieties of this *Labiata*, to reconstruct the whole history, to follow all the stages of the invention, from the primitive disorder of the white Sage under my eyes to the latest improvements of the *Salvia officinalis*. What conclusion are we to draw? Is the system still in the experimental stage among the aromatic tribe? Has it not yet left the period of models and "trial trips," as in the case of the Archimedean screw in the Sainfoin family? Has the excellence of the automatic lever not yet been unanimously admitted? Can it be, then, that everything is not immutable and pre-established; and are they still arguing and experimenting in this world which we look upon as set in a fatal organic groove? ¹

¹ For some years, I have been engaged upon a series of experiments in the hybridization of Sages, artificially fertilizing (after taking the usual precautions against any interference of wind or insects) a variety whose floral mechanism has reached a high

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Be this as it may, the flower of most varieties of the Sage presents an attractive solution of the great problem of cross-fertilization. But, even as, among men, a new invention is at once taken up, simplified, perfected by a host of small indefatigable seekers, so, in the world of what we may call mechanical flowers, the patent of the Sage has been elaborated and in many details strangely improved. A well-known *Scrophularinea*, the common Lousewort, or Red-rattle (*Pedicularis sylvatica*), which you have surely noticed in the shady parts of small woods and heaths, has introduced some extremely ingenious modifications. The shape of the corolla is almost similar to that of the Sage; the stigma and the two anthers are all three contained in the upper hood. Only the little moist tip of the stigma protrudes from the hood, while

state of perfection with the pollen of a very backward variety; and *vice versa*. My observations are not yet sufficiently numerous to enable me to give the details here. Nevertheless, it appears as if a general law were already being evolved, namely that the backward Sage readily adopts the improvements of the more advanced variety, whereas the latter is not so prone to accept the defects of the first. This would tend to throw an interesting side-light upon the operations, the habits, the preferences, the tastes of nature at her best. But these are experiments which must of necessity be slow and long, because of the time lost in collecting the different varieties, because of the numberless proofs and counter-proofs required and so on. It would be premature, therefore, as yet to draw the slightest conclusion.

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the anthers remain strict captives. In this silky tabernacle, therefore, the organs of the two sexes are very close together and even in immediate contact; nevertheless, thanks to an arrangement quite different from that of the Sage, self-fertilization is utterly impossible. The anthers, in fact, form two sacks filled with powder; each of the sacks has only one opening and they are juxtaposed in such a way that the openings coincide and mutually close each other. They are kept forcibly inside the hood, on their curved, springy stalks, by a sort of teeth. The bee or humble-bee that enters the flower to sip its nectar necessarily pushes these teeth aside; and the sacks are no sooner set free than they fly up, are flung outside the hood and alight upon the back of the insect.

But the genius and foresight of the flower go farther than this. As Hermann Müller, who was the first to make a complete study of the wonderful mechanism of the Lousewort, observes (I am quoting from a summary):

“If the stamens struck the insect while preserving their relative positions, not a grain of pollen would leave them, because their orifices reciprocally close each other. But a contrivance which is as simple as it is ingenious overcomes the

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difficulty. The lower lip of the corolla, instead of being symmetrical and horizontal, is irregular and slanting, so that one side of it is higher by a few millimetres than the other. The humble-bee resting upon it must herself necessarily stand in a sloping position. The result is that her head strikes first one and then the other of the projections of the corolla. Therefore the releasing of the stamens also takes place successively; and, one after the other, their orifices, now freed, strike the insect and sprinkle her with fertilizing dust.

“When the humble-bee next passes to another flower, she inevitably fertilizes it, because—and I have purposely omitted this detail—what she meets first of all, when thrusting her head into the entrance to the corolla, is the stigma, which grazes her just at the spot where she is about, the moment after, to be struck by the stamens, the exact spot where she has already been touched by the stamens of the flower which she has last left.”

These instances might be multiplied indefinitely; every flower has its idea, its acquired experience which it turns to advantage. When we examine closely their little inventions,

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their diverse methods, we are reminded of those enthralling exhibitions of machine-tools, of machines for making machinery, in which the mechanical genius of man reveals all its resources. But mechanical genius dates from yesterday, whereas floral mechanism has been at work for thousands of years. When the flowers made their appearance upon our earth, there were no models around them which they could imitate; they had to derive everything from within themselves. At the period when we had not gone beyond the club, the bow and the battle-flail; in the comparatively recent days when we conceived the spinning-wheel, the pulley, the tackle, the ram; at the time—it was last year, so to speak—when our master-pieces were the catapult, the clock and the weaving-loom, the Sage had contrived the uprights and counter-weights of its lever of precision and the Lousewort its sacks closed up as though for a scientific experiment, the successive releasing of its springs and the combination of its inclined planes. Who, say a hundred years ago, dreamt of the properties of the screw-propeller which the Maple and the Lime-tree have been using since the birth of the trees? When shall we succeed in building a parachute or a flying-machine as firm, as light, as delicate and as safe as that of the Dandelion?

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When shall we discover the secret of cutting in so frail a fabric as the silk of the petals a spring as powerful as that which projects into space the golden pollen of the Spanish Broom? As for the Momordica, or Squirting Cucumber, whose name I mentioned at the beginning of this little study, who shall tell us the mystery of its miraculous strength? Do you know the Momordica? It is a humble *Cucurbitacea*, common enough along the Mediterranean coast. Its prickly fruit, which resembles a small cucumber, is endowed with inexplicable vitality and energy. You have but to touch it, at the moment of its maturity, and it suddenly quits its stalk by means of a convulsive contraction and, through the hole produced by the wrench, shoots, mingled with numerous seeds, a mucilaginous stream of such wonderful intensity that it carries the seed to four or five yards' distance from the natal plant. The action is as extraordinary, in proportion, as though we were to succeed in emptying ourselves with a single spasmodic movement and in precipitating all our organs, our viscera and our blood to a distance of half a mile from our skin and skeleton.

A large number of seeds besides have ballistic methods and employ sources of energy that are more or less unknown to us. Remember, for instance, the explosions of the Colza

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and the Heath. But one of the great masters of vegetable gunnery is the Spurge. The Spurge is an *Euphorbiacea* of our climes, a tall and fairly ornamented "weed," which often exceeds the height of a man. I have a branch of Spurge on my table at this moment, steeped in a glass of water. It has trifid, greenish berries, which contain the seeds. From time to time, one of these berries bursts with a loud report; and the seeds, gifted with a prodigious initial velocity, strike the furniture and the walls on every side. If one of them hits your face, you feel as though you had been stung by an insect, so extraordinary is the penetrating force of these tiny seeds, each no larger than a pin's head. Examine the berry, look for the springs that give it life: you shall not find the secret of this force, which is as invisible as that of our nerves.

The Spanish Broom (*Spartium junceum*) has not only pods, but flowers fitted with springs. You may have remarked the wonderful plant. It is the proudest representative of this mighty family of the Brooms. Greedy of life, poor, sober, robust, rejecting no soil, no trial, it forms along the paths and in the mountains of the South huge, tufted balls, sometimes ten feet high, which, between May and June, are covered with a magnificent bloom of pure gold whose per-

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fumes, mingling with those of its habitual neighbour, the Honeysuckle, spread under the fury of a fierce sun delights that are not to be described save by evoking celestial dews, Elysian springs, cool streams and starry transparencies in the hollow of azure grottoes. . . .

The flower of this Broom, like that of all the papilionaceous *Leguminosæ*, resemble the flowers of the Peas of our gardens; and its lower petals, welded like the beak of a galley, hermetically contain the stamens and the pistil. So long as it is not ripe, the bee who explores it finds it impenetrable. But, as soon as the moment of puberty arrives for the captive bride and grooms, the beak bends under the weight of the insect that rests upon it; and the golden chamber bursts voluptuously, hurling with violence and afar, over the visitor, over the flowers around, a cloud of luminous dust, which, by way of additional precaution, a broad, eaved petal dashes upon the stigma to be impregnated.

Let us leave the seeds and return to the flowers. As I have said one could prolong indefinitely the list of their ingenious inventions. I refer those who might wish to study

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these problems thoroughly to the works of Christian Konrad Sprengel, who was the first, in 1793, in his curious volume, *Das entdeckte Geheimniss der Natur im Bau und in der Befruchtung der Blumen*, to analyze the functions of the different organs in Orchids; next, to the books of Charles Darwin, Dr. Hermann Müller of Lippstadt, Hildebrand, Delpino the Italian, Sir William Hooker, Robert Brown and many others.

We shall find the most perfect and the most harmonious manifestations of vegetable intelligence among the Orchids. In these contorted and eccentric flowers, the genius of the plant reaches its extreme limits and, with unwonted fire, pierces the wall that separates the kingdoms. For that matter, this name of Orchid must not be allowed to mislead us or make us believe that we have here to do only with rare and precious flowers, with those hothouse queens which seem to claim the care of the goldsmith rather than the gardener. Our native wild flora, which comprises all our modest "weeds," numbers more than twenty-five species of Orchids, including just the most ingenious and complex. It is these which Darwin has studied in his book, *On the Various Contrivances by which Orchids are fertilized by Insects*, which is the wonderful history of the most heroic efforts of the soul

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of the flower. It is out of the question that I should here, in a few lines, summarize that abundant and fairylike biography. Nevertheless, since we are on the subject of the intelligence of flowers, it is necessary that we should give some idea of the methods and the mental habits of that which excels all the others in the art of compelling the bee or the butterfly to do exactly what it wishes, in the prescribed form and time.

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It is not easy to explain without diagrams the extraordinarily complex mechanism of the Orchid. Nevertheless, I will try to convey a fair notion of it with the aid of more or less approximate comparisons, while avoiding, as far as possible, the use of technical terms such as *retinaculum*, *labellum*, *rostellum* and the rest, which evoke no precise image in the minds of persons unfamiliar with botany.

Let us take one of the most widely-distributed Orchids in our regions, the *Orchis maculata*, for instance, or rather, because it is a little larger and therefore more easily observed, the *Orchis latifolia*, the Marsh Orchid, commonly known as the Meadow-rocket. It is a perennial plant and grows to a height of an inch or more. It is pretty frequent in the woods

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and damp meadows and has a thyrses of little pink flowers, which bloom in May and June.

The typical flower of our Orchids represents with some closeness the fantastic, yawning mouth of a Chinese dragon. The lower lip, which is very long, hangs in the form of a jagged or dentate apron, serves as a perch or resting-place for the insect. The upper lip rounds into a sort of hood, which shelters the essential organs; while, at the back of the flower, beside the peduncle, there falls a kind of spur or long, pointed horn, which contains the nectar. In most flowers, the stigma, or female organ, is a more or less viscid little tuft which, at the end of a frail stalk, patiently awaits the coming of the pollen. In the Orchid, this traditional installation has altered past recognition. At the back of the mouth, in the place occupied in the throat by the uvula, are two closely-welded stigmata, above which rises a third stigma modified into an extraordinary organ. At its top, it carries a sort of little pouch, or, more correctly, a sort of stoup, which is called the *rostellum*. This stoup is full of a viscid fluid in which soak two tiny balls whence issue two short stalks laden at their upper extremity with a packet of grains of pollen carefully tied up.

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Let us now see what happens when an insect enters the flower. She lands on the lower lip, outspread to receive her, and, attracted by the scent of the nectar, seeks to reach the horn that contains it, right at the back. But the passage is purposely very narrow; and the insect's head, as she advances, necessarily strikes the stoup. The latter, sensitive to the least shock, is at once ripped along a suitable line and lays bare the two little balls steeped in the viscid fluid. These, coming into immediate contact with the visitor's skull, fasten to it and become firmly stuck to it, so that, when the insect leaves the flower, she carries them away and, with them, the two stalks which rise from them and which end in the packets of tied-up pollen. We therefore have the insect capped with two straight, bottle-shaped horns. The unconscious artisan of a difficult work now visits a neighbouring flower. If her horns remained stiff, they would simply strike with their packets of pollen the other packets of pollen soaking in the vigilant stoup; and no event would spring from this mingling of pollen with pollen. But here the Orchid's genius, experience and foresight become apparent. It has minutely calculated the time needed for the insect to suck the nectar and repair to the next flower; and it has ascertained that this requires,

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on an average, thirty seconds. We have seen that the packets of pollen are carried on two short stalks inserted into the viscid balls. Now at the point of insertion there is, under each stalk, a small membranous disc, whose only function is, at the end of thirty seconds, to contract and throw forward the stalks, causing them to curve and describe an arc of ninety degrees. This is the result of a fresh calculation, not of time, on this occasion, but of space. The two horns of pollen that cap the nuptial messenger are now horizontal and point in front of her head, so that, when she enters the next flower, they will just strike the two welded stigmata under the overhanging stoup.

This is not all and the genius of the Orchid has not yet expended all its foresight. The stigma receiving the blow of the packet of pollen is coated with a viscid substance. If this substance were as powerfully adhesive as that contained in the little stoup, the pollen-masses, after their stalks were broken, would stick to it and remain fixed to it intact; and their destiny would be ended. This must not be; it is important that the chances of the pollen should not be exhausted in a single venture, but rather that they should be multiplied as far as possible. The flower that counts the seconds and measures the

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line at units is a chemist to boot and distils two sorts of gums: one extremely adhesive, which hardens as soon as it touches the air and glues the pollen-horns to the insect's head; the other greatly diluted, for the work of the stigma. This latter is just prehensile enough slightly to unfasten or loosen the tenuous and elastic threads wherewith the grains of pollen are tied. Some of these grains adhere to it, but the pollen-mass is not destroyed; and, when the insect visits other flowers, she will continue her fertilizing labours almost indefinitely.

Have I expounded the whole miracle? No; I have still to call attention to many a neglected detail: among others, to the movement of the little stoup, which, after its membrane has been ruptured to unmask the viscid balls, immediately lifts its lower rim in order to preserve in good condition, in the sticky fluid, the packet of pollen which the insect may not have carried off. We should also note the very curiously-combined divergence of the pollen-stalks on the head of the insect, as well as certain chemical precautions common to all plants; for M. Gaston Bonnier's recent experiments would seem to prove that every flower, in order to maintain its species intact, secretes poisons that destroy or sterilize any foreign pollen. This is more or less all that we see; but here, as in all things,

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the real, the great miracle begins where our power of vision ends.

17

I have this moment found, in an untilled corner of the olive-yard a splendid sprig of *Loroglossum hiricinum*, a variety which, for I know not what reason (perhaps it is very rare in England), Darwin omitted to study. It is certainly the most remarkable, the most fantastic, the most astounding of all our native Orchids. If it were of the size of the American Orchids, one might declare that there is no more fanciful plant in existence. Imagine a thyrses, like that of the Hyacinth, but twice as tall. It is symmetrically adorned with ill-favoured, three-cornered flowers, of a greenish white stippled with pale violet. The lower petal, embellished at its source with bronzed wattles, long, drooping moustaches and sinister-looking lilac buboes, stretches out interminably, madly, unreally, in the shape of a corkscrew riband of the colour assumed by drowned men after a month's immersion in the river. From the whole, which conjures up the idea of the most fearsome maladies and seems to blossom in some dim land of mocking nightmares and witcheries, there issues a potent and abominable stench as of a poisoned goat, which

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spreads afar and reveals the presence of the monster. I am selecting and describing this nauseating Orchid because it is fairly common in France, is easily recognized and adapts itself very well, by reason of its height and the distinctness of its organs, to any experiments that one might wish to make. We have only, in fact, to insert the end of a wooden match in the flower and push it carefully to the bottom of the nectary, in order to witness with the naked eye all the successive phases of fertilization. Grazed in passing, the pouch or *rostellum* sinks down, exposing the little viscid disc (the *Loroglossum* has only one) that supports the two pollen-stalks. This disc grips the end of the wood violently at once; the two cells that contain the balls of pollen open lengthwise; and, when the match is withdrawn, its tip is firmly capped with two stiff, diverging horns, each ending in a golden ball. Unfortunately, we do not here, as in the experiment with the *Orchis latifolia*, enjoy the charming spectacle afforded by the gradual and precise inclination of the two horns. Why are they not lowered? We have but to push the capped match into a neighbouring nectary to ascertain that this movement would be superfluous, the flower being much larger than that of the *Orchis maculata* or *latifolia* and the nectar-horn arranged in

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such a way that, when the insect laden with the pollen-masses enters it, those masses just reach the level of the stigma to be fertilized.

Let us add that it is important to the success of the experiment to select a flower that is quite ripe. We do not know when the flower is ripe; but the insect and the flower know, for the flower does not invite its indispensable guests, by offering them a drop of nectar, until the moment when all its apparatus is in working order.

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This is the basis of the system of fertilization adopted by the Orchid of our climes. But each species, every family modifies and improves the details in accordance with its particular experience, psychology and convenience. The *Orchis* or *Anacamptis pyramidalis*, for instance, which is one of the most intelligent, has added to its lower lip or *labellum* two little ridges which guide the proboscis of the insect to the nectar and compel her to accomplish exactly what is expected of her. Darwin very justly compares this ingenious accessory with the little instrument for guiding a thread into the fine eye of a needle. Here is another interesting improve-

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ment: the two little balls that carry the pollen-stalks and soak in the stoup are replaced by a single viscid disc, shaped like a saddle. If, following the road to be taken by the insect's proboscis, we insert the point of a needle or a bristle into the flower, we very plainly perceive the advantages of this simpler and more practical arrangement. As the bristle touches the stoup, the latter splits in a symmetrical line and uncovers the saddle-shaped disc, which at once fastens to the bristle. Withdraw the bristle smartly and you will just have time to catch the pretty action of the saddle, which, seated on the bristle or needle, curls its two flaps inwards, so as to embrace the object that supports it. The purpose of this movement is to strengthen the adhesive power of the saddle and, above all, to ensure with greater precision than in the *Orchis latifolia* the indispensable divergence of the pollen-stalks. As soon as the saddle has curled round the bristle and as the pollen-stalks planted in it, drawn apart by its contraction, are forced to diverge, the second movement of the stalks begins and they bend towards the tip of the bristle, in the same manner as in the Orchid which we have already studied. The two combined movements are performed in thirty to thirty-four seconds.

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Is it not exactly in this manner, by means of trifles, of successive overhauls and retouches, that human inventions proceed? We have all, in the latest of our mechanical industries, followed the tiny, but continual improvements in the sparking-plug, the carburetter, the clutch and the speed-gear. It would really seem as though ideas came to the flowers in the same way as to us. The flowers grope in the same darkness, encounter the same obstacles, the same ill-will, in the same unknown. They know the same laws, the same disappointment, the same slow and difficult triumphs. They would appear to possess our patience, our perseverance, our self-love, the same varied degrees of intelligence, almost the same hopes and the same ideals. They struggle, like ourselves, against a great indifferent force that ends by assisting them. Their inventive imagination not only follows the same prudent and minute methods, the same tiring, narrow and winding little paths: it also has unexpected leaps and bounds that suddenly bring to perfection an uncertain discovery. It is thus that a family of great inventors, among the Orchids, a strange and rich American family, that of the *Catasetidæ*, obeying a bold inspiration, abruptly altered a number of

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habits that doubtless appeared to it too primitive. First of all, the separation of the sexes is absolute: each has its particular flower. Next, the *pollinium*, or mass or packet of pollen, no longer dips its stalk in a stoup full of gum, there awaiting, a little inertly and, in any case, without initiative, the happy accident that shall fix it to the insect's head. It is bent back on a powerful spring, in a sort of cell. Nothing attracts the insect specially in the direction of this cell. Nor have the haughty *Catasetidæ* reckoned, like the common Orchid, on this or that movement of the visitor: a guided and precise movement, if you wish, but nevertheless a contingent movement. No, the insect no longer enters a flower merely endowed with an admirable mechanism: she enters an animated and literally sensitive flower. Hardly has she landed in the magnificent outer court of copper-coloured silk before long and nervous feelers, which she cannot avoid touching, carry the alarm all over the edifice. Forthwith the cell is torn asunder in which the pollen-mass, divided into two packets, is held captive on its bent pedicel, which is supported on a large viscid disc. Abruptly released, the pedicel springs back like a bow, dragging with it the two packets of pollen and the viscid disc, which are projected outside. As the re-

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sult of a curious ballistic calculation, the disc is always hurled first and strikes the insect, to whom it adheres. She, stunned by the blow, has but one thought: to leave the aggressive corolla with all speed and take refuge in a neighbouring flower. This is all that the American Orchid wanted.

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Shall I also mention the curious and practical simplifications introduced into the general system by another family of exotic Orchids, the *Cypripedeæ*? Let us still bear in mind the devious ways of human inventions: we have here an amusing imitation. A fitter, in the engine-room; an assistant, a pupil, in the laboratory, says, one day, to his principal:

“Suppose we tried to do just the opposite? . . . Suppose we reversed the movement? . . . Suppose we inverted the mixture of the fluids?”

The experiment is tried; and suddenly from the unknown issues something unexpected.

One could easily believe the *Cypripedeæ* to have held similar conversations among themselves. We all know the *Cypripedium*, or Ladies'-slipper: with its enormous shoe chin, its crabbed and venomous air, it is the most characteristic

ORCHIS LATIFOLIA



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flower of our hothouses, the one that seems to us the typical Orchid, so to speak. The *Cypripedium* has boldly suppressed all the complicated and delicate apparatus of the springy pollen-packets, the diverging stalks, the viscid discs, the insidious gums and the rest. Its clog-like chin and a barren, scutate anther bar the entrance in such a manner as to compel the insect to pass its proboscis over two little heaps of pollen. But this is not the important point: the wholly unexpected and abnormal thing is that, contrary to what we have observed in all the other species, it is no longer the stigma, the female organ, that is viscid, but the pollen itself, whose grains, instead of being powdery, are covered with a coat so glutinous that it can be stretched and drawn into threads. What are the advantages and the drawbacks of this new arrangement? It is to be feared that the pollen carried off by the insect may adhere to any object other than the stigma; on the other hand, the stigma is dispensed from secreting the fluid intended to sterilize all foreign pollens. In any case, this problem would demand a special study. In the same way, there are patents whose usefulness we do not grasp at once.

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To have done with this strange tribe of the Orchids, it remains for us to say a few words on an auxiliary organ that sets the whole mechanism going: I mean the nectary, which, for that matter, has been the object, on the part of the genius of the species, of enquiries, attempts and experiments as intelligent and as varied as those which are incessantly modifying the economy of the essential organs.

The nectary, as we have seen, is, in principle, a sort of spur, or long, pointed horn, that opens right at the bottom of the flower, beside the stalk, and acts more or less as a counterpoise to the corolla. It contains a sugary liquid, the nectar, which serves as food for butterflies, beetles and other insects and which is turned into honey by the bee. Its business, therefore, is to attract the indispensable guests. It is adapted to their size, their habits, their tastes; it is always arranged in such a way that they cannot introduce or withdraw their proboscis without scrupulously and successively performing all the rites prescribed by the organic laws of the flower.

We already know enough of the fantastic character and imagination of the Orchids to gather that here, as elsewhere—and even more than elsewhere, for the suppler organ lent

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itself to this more readily—their inventive, practical, observant and groping spirit gave itself free scope. One of them, for instance, the *Sarcanthus teretifolius*, probably failing in its endeavour to elaborate a viscid fluid that should harden quickly enough to stick the packet of pollen to the insect's head, overcame the difficulty by delaying the visitor's proboscis as long as possible in the narrow passages leading to the nectar. The labyrinth which it laid out is so complicated that Bauer, Darwin's skilful draughtsman, had to admit himself beaten and gave up the attempt to draw it.

There are some which, starting on the excellent principle that every simplification is an improvement, have boldly suppressed the nectar-horn. They have replaced it by certain fleshly, fantastic and evidently succulent excrescences which are nibbled by the insects. Is it necessary to add that these excrescences are always placed in such a manner that the guest who feasts on them must inevitably set all the pollen-machinery in movement?

But, without lingering over a thousand very various little artifices, let us end these fairy stories by studying the lures

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of the *Coryanthes macrantha*. Truly, we no longer know with exactly what sort of being we here have to do. The astounding Orchid has contrived this: its lower lip or *labellum* forms a sort of large bucket, into which drops of almost pure water, secreted by two horns situated overhead, fall continually; when this bucket is half full, the water flows away on one side by a spout or gutter. All this hydraulic installation is very remarkable in itself; but here is where the alarming, I might almost say the diabolical side of the combination begins. The liquid which is secreted by the horns and which accumulates in the satin basin is not nectar and is in no way intended to attract the insects: it has a much more delicate function in the really Machiavellian plan of this strange flower. The artless insects are invited by the sugary perfumes diffused by the fleshy excrescences of which I spoke above to walk into the trap. These excrescences are above the bucket, in a sort of chamber to which two lateral openings give access. The big visiting bee—the flower, being enormous, allures hardly any but the heaviest *Hymenoptera*, as though the others experienced a certain shame at entering such vast and sumptuous halls—the big bee begins to nibble the savoury wattles. If she were alone, she would go away

CATASETUM AND CYPRIPEDIUMS

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quietly, after finishing her meal, without even grazing the bucket of water, the stigma and the pollen; and none of that which is required would take place. But the wise Orchid has observed the life that moves around it. It knows that the bees form an innumerable, greedy and busy people, that they come out by thousands in the sun-lit hours, that a perfume has but to quiver like a kiss on the threshold of an opening flower for them to hasten in numbers to the banquet laid under the nuptial tent. We therefore have two or three looters in the sugary chamber: the space is scanty, the walls slippery, the guests ill-mannered. They crowd and hustle one another to such good purpose that one of them always ends by falling into the bucket that awaits her beneath the treacherous repast. She there finds an unexpected bath, conscientiously wets her bright, diaphanous wings and, despite immense efforts, cannot succeed in resuming her flight. This is where the astute flower lies in wait for her. There is but one opening through which she can leave the magic bucket: the spout that acts as a wastepipe for the overflow of the reservoir. It is just wide enough to allow of the passage of the insect, whose back touches first the sticky surface of the stigma and then the viscid glands of the pollen-masses that await her along the vaulted

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way. She thus escapes, laden with the adhesive dust, and enters a neighbouring flower, where the tragedy of the banquet, the hustling, the fall, the bath and the escape is reënacted and perforce brings the imported pollen into contact with the greedy stigma.

Here, then, we have a flower that knows and plays upon the passions of insects. Nor can it be pretended that all these are only so many more or less romantic interpretations: no, the facts have been precisely and scientifically observed and it is impossible to explain the use and arrangement of the flower's different organs in any other manner. We must accept the evidence as it stands. This incredible and efficacious artifice is the more surprising inasmuch as it does not here tend to satisfy the immediate cravings of hunger that sharpen the dullest wits; it has only a distant ideal in view: the propagation of the species.

But why, we shall be asked, these fantastic complications which end only by increasing the risk of failure? Let us not hasten to give judgment and reply. We know nothing of the reasons of the plant. Do we know what obstacles the flower encounters in the direction of logic and simplicity? Do we know thoroughly a single one of the organic laws of its ex-

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istence and its growth? One watching us from the height of Mars or Venus, as we exert ourselves to achieve the conquest of the air, might, in his turn, ask:

“Why those shapeless and monstrous machines, those balloons, those aeroplanes, those parachutes, when it were so easy to copy the birds and to supply the arms with a pair of all-sufficing wings?”

23

To these proofs of intelligence, man's somewhat puerile vanity opposes the traditional objection: yes, they create marvels, but those marvels remain eternally the same. Each species, each variety has its system and, from generation to generation, introduces no perceptible improvement. It is true that since we have been observing them—that is to say, during the past fifty years—we have not seen the *Coryanthes macrantha* or the *Catasetidæ* refine upon their trap: this is all that we can say; and it is really not enough. Have we as much as attempted the most elementary experiments; and do we know what the successive generations of our astonishing Bathing-orchid might do in a century's time, if placed in different surroundings, among insects to which it was not accustomed?

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Besides, the names which we give to the orders, species and varieties end by deceiving ourselves; and we thus create imaginary types which we believe to be fixed, whereas they are probably only the representatives of one and the same flower, which continues to modify its organs slowly in accordance with slow circumstances.

The flowers arrived on this earth before the insects; they had, therefore, when the latter appeared, to adapt an entirely new system of machinery to the habits of these unexpected collaborators. This geologically-incontestable fact alone, amid all that which we do not know, is enough to establish evolution; and does not this somewhat vague word mean, after all, adaptation, modification, intelligent progress?

It were easy, moreover, without appealing to this prehistoric event, to bring together a large number of facts which would show that the faculty of adaptation and intelligent progress is not reserved exclusively for the human race. Without returning to the detailed chapters which I have devoted to this subject in *The Life of the Bee*, I will simply recall two or three topical details which are there mentioned. The bees, for instance, invented the hive. In the wild and primitive state and in their country of origin, they work in the

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open air. It was the uncertainty, the inclemency of our northern seasons that gave them the idea of seeking a shelter in hollow trees or a hole in the rocks. This ingenious idea restored to the work of looting and to the care of the eggs the thousands of bees stationed around the combs to maintain the necessary heat. It is not uncommon, especially in the South, during exceptionally mild summers, to find them reverting to the tropical manners of their ancestors.¹

Another fact: when transported to Australia or California, our black bee completely alters her habits. After one or two years, finding that summer is perpetual and flowers for ever abundant, she will live from day to day, content to gather the honey and pollen indispensable for the day's consumption; and, her recent and thoughtful observation triumphing over

¹I had just written these lines, when M. E. L. Bouvier made a communication in the Academy of Science (*cf.* the report of the 7th of May, 1906) on the subject of two nidifications in the open air observed in Paris, one in a *Sophora japonica*, the other in a chestnut-tree. The latter, which hung from a small branch furnished with two almost contiguous forks, was the more remarkable of the two, because of its evident and intelligent adaptation to particularly difficult circumstances:

"The bees," says M. de Parville, in his review in the *Journal des Débats* of the 31st of May, 1906, "built consolidating pillars and resorted to really remarkable artifices of protection and ended by transforming the two forks of the chestnut-tree into a solid ceiling. An ingenious man would certainly not have done so well.

"To protect themselves from the rain, they had put up fences, thicker walls and sunblinds. One can conceive no idea of the perfection of the industry of the bees, short of closely observing the architecture of the two nidifications, now at the Museum."

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hereditary experience, she will cease to make provision for her winter. Büchner mentions an analogous fact, which also proves the bees' adaptation to circumstances, not slow, secular, unconscious and fatal, but immediate and intelligent: in Barbados, the bees whose hives are in the midst of the refineries, where they find sugar in plenty during the whole year, will entirely abandon their visits to the flowers.

Let us lastly recall the amusing manner in which the bees gave the lie to two learned English entomologists, Kirby and Spence:

"Show us," they said, "but *one* instance of bees having substituted mud or mortar for propolis, mitys, or pissoceros, and there could be no doubt of their being guided by reason."

Hardly had they expressed this somewhat arbitrary wish, when another naturalist, Andrew Knight, having coated the bark of certain trees with a sort of cement made of wax and turpentine, observed that his bees ceased entirely to gather propolis and employed only this new and unknown substance, which they found ready prepared and abundant near their home. Moreover, in apiculture, when pollen is scarce, the bee-keeper has but to place a few handfuls of flour at their disposal for them at once to understand that this can serve the

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same purpose and be turned to the same use as the dust of the anthers, although its taste, smell and colour are absolutely different.

What I have said in the matter of the bees might, I think, *Mutatis mutandis*, be confirmed in the kingdom of the flowers. It were probably enough for the wonderful evolutionary efforts of the numerous varieties of the Sage, for instance, to be subjected to a few experiments and studied more systematically than a layman like myself is capable of doing. Meanwhile, among many other indications that could easily be collected, we learn from a curious monograph on cereals, by Babinet, that certain plants, when transported far from their wonted climate, observe the new circumstances and avail themselves of them, exactly as the bees do. Thus, in the hottest regions of Asia, Africa and America, where the winter does not kill it annually, our corn becomes again what it must have been at first, a perennial plant, like grass. It remains always green, multiplies by the root and ceases to bear either ears or grain. When, therefore, from its original tropical country, it came to be acclimatized in our frost regions, it had to upset its habits and invent a new method of multiplying. As Babinet so well says:

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“The organism of the plant by an inconceivable miracle, seemed to foresee the necessity of passing through the grain stage, lest it should perish outright during the wintry season.”

24

In any case, to destroy the objection which we mentioned above and which has caused us to travel so far from our immediate subject, it would be enough to establish one act of intelligent progress, were it but for a single occasion, outside mankind. But, apart from the pleasure which one takes in refuting a self-sufficient and antiquated argument, how little importance, when all is said, attaches to this question of the personal intelligence of the flowers, the insects or the birds! Suppose that we say, speaking of the Orchid and the bee alike, that it is nature and not the plant or the insect that calculates, that combines, that adorns, invents and thinks: what interest can this distinction have for us? A much greater question and one much worthier of our eager attention soars above these details. What we have to do is to grasp the character, the quality, the habits and perhaps the object of the general intelligence whence emanate all the intelligent acts performed upon this earth. It is from this point of view that the study

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of those creatures—the ants and bees, among others—wherein, the human form excepted, the proceedings and ideals of this genius are most clearly manifested becomes one of the most curious that we can undertake. It would seem, after all that we have noted, that those tendencies, those intellectual methods must be at least as complex, as advanced, as startling in the Orchids as in the social *Hymenoptera*. Let us add that a large number of the motives and a portion of the logic of these restless insects, so difficult of observation, still escape us, whereas we can grasp with ease all the silent reasons, all the wise and stable arguments of the placid flower.

25

Now what do we observe, when we perceive nature (or the general intelligence or the universal genius: the name matters but little) at work in the world of flowers? Many things; and, to mention it only in passing, for the subject would lend itself to a long study, we begin by ascertaining that her idea of beauty, of gladness, her methods of attraction, her æsthetic tastes are very near akin to our own. But no doubt it would be more correct to state that ours agree with hers. It is, in fact, very uncertain whether we have ever in-

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vented a beauty peculiar to ourselves. All our architectural, all our musical motives, all our harmonies of colour and light are borrowed direct from nature. Without calling upon the sea, the mountains, the skies, the night, the twilight, what might one not say, for instance, of the beauty of the trees? I speak not only of the tree considered in the forest, where it is one of the powers of the earth, perhaps the chief source of our instincts, of our perception of the universe, but of the tree in itself, the solitary tree, whose green old age is laden with a thousand seasons. Among those impressions which, without our knowing it, form the limpid hollow and perhaps the subsoil of happiness and calm of our whole existence, which of us does not preserve the recollection of a few fine trees? When a man has passed mid-life, when he has come to the end of the wondering period, when he has exhausted nearly all the sights that the art, the genius and the luxury of men and centuries can offer, after experiencing and comparing many things, he returns to very simple memories. They raise upon the purer horizon two or three innocent, invariable and refreshing images, which he would wish to carry away with him in his last sleep, if it be true that an image can pass the threshold that separates our two worlds. For myself, I

CORYANTHES MACULATA



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can picture no paradise nor after-life, however splendid, where a certain magnificent Beech in the Sainte-Baume were out of place, or a certain Cypress or a certain Umbrella-pine of Florence or of a charming hermitage near my own house, any one of which affords to the passer-by a model of all the great movements of necessary resistance, of peaceful courage, of soaring, of gravity, of silent victory and of perseverance.

26

But I am wandering too far afield: I intended only to remark, with reference to the flower, that nature, when she wishes to be beautiful, to please, to delight and to prove herself happy, does almost what we should do had we her treasures at our disposal. I know that, speaking thus, I am speaking a little like the bishop who marvelled that Providence always made the great river flow past the big cities; but it is difficult to look upon these things from any other than the human point of view. Let us, then, from this point of view, consider that we should know very few signs or expressions of happiness if we did not know the flower. In order to judge of its power of gladness and beauty, one must live in a part of the country where it reigns undivided, such as the corner of Provence, between the Siagne and the Loup,

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where I am writing these lines. Here, truly, the flower is the sole monarch of the hills and valleys. The peasants have lost the habit of growing corn, as though they had now only to provide for the needs of a more subtle race of men, who live on sweet fragrance and ambrosia. The fields form one great nosegay, which is incessantly renewed, and the perfumes that succeed one another seem to circle in the dance all round the azure year. Anemones, Gilliflowers, Mimosa, Violets, Pinks, Narcissus, Hyacinths, Jonquils, Mignonette, Jasmine, Tuberose invade the days, the nights, the winter, summer, spring and autumn months. But the magnificent hour belongs to the Roses of May. Then, as far as the eye can see, from the slope of the hills to the hollows of the plains, between banks of Vines and Olive trees, they flow on every side like a stream of petals flooding the houses and the trees, a stream of the colour which we assign to youth and health and joy. The scent, both warm and cool, but, above all things spacious and heavenly, emanates, one would think, straight from the sources of beatitude. The roads, the paths are carved in the pulp of the flower, in the very substance of Paradise. For the first time in our lives, we seem to have a satisfying vision of happiness.

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27

Still speaking from our human point of view and persevering in the necessary illusion, let us add to our first remark one a little more extensive, a little less hazardous and perhaps big with consequences, namely, that the genius of the Earth, which is probably that of the universe, acts, in the vital struggle, exactly as a man would act. It employs the same methods, the same logic. It attains its aim by the same means that we would use: it gropes, it hesitates, it corrects itself time after time; it adds, it suppresses, it recognizes and repairs its errors, as we should do in its place. It makes great efforts, it invents with difficulty and little by little, after the manner of the engineers and artisans in our workshops. Like ourselves, it fights against the huge, ponderous, obscure mass of its being. It knows no more than we do whither it is going; it seeks and finds itself gradually. It has an ideal that is often confused, but one wherein, nevertheless, we distinguish a host of great lines that rise towards a more ardent, complex, nervous and spiritual life. Materially, it disposes of infinite resources, it knows the secret of prodigious forces of which we know nothing; but, intellectually, it appears strictly to occupy our sphere: we cannot prove that, hitherto,

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it has exceeded its limits; and, if it does not take anything from beyond them, does this not mean that there is nothing outside that sphere? Does it not mean that the methods of the human mind are the only possible methods, that man has not erred, that he is neither an exception nor a monster, but the being through whom pass, in whom are most intensely manifested the great demands, the great desires of the universe?

28

The landmarks of our consciousness emerge slowly, grudgingly. Perhaps Plato's famous allegory is no longer sufficient: I mean the cave with the wall above it whence the shadows of unknown men and objects are thrown into the cave below; but, if we tried to substitute a new and more exact image in its place, this would be hardly more consoling. Suppose Plato's cave enlarged. No ray of daylight ever enters it. With the exception of light and fire, it has been carefully supplied with all that our civilization admits; and men have been imprisoned in it from their birth. They would not regret the light, having never seen it; they would not be blind, their eyes would not be dead, but, having nothing to look at, would probably become the most sensitive organ of touch.

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In order to recognize their actions, let us picture these wretches in their darkness, amidst the multitude of unknown objects that surround them. What quaint mistakes, what incredible slips, what unexpected interpretations must needs occur! But how touching and often how ingenious would seem the purpose to which they would put things that were created for use in the dark! How often would they guess aright? And how great would be their amazement if, suddenly, by the light of day, they discovered the nature and the real object of utensils and furniture which they had accommodated as best they could to the uncertainties of the shadow!

And yet their position seems simple and easy, compared with our own. The mystery wherein they grovel is limited. They are deprived of but one sense, whereas it is impossible to estimate the number of those in which we are lacking. The cause of their mistakes is one alone; the sources of ours are countless.

As we live in a cave of this sort, is it not interesting to find that the power which has placed us there acts often—and in some important matters—even as we ourselves act? Here we have glimmers in our subterranean cave to show us that we have not mistaken the use of every object to be

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found therein; and some of these glimmers are conveyed to us by the insects and the flowers.

29

We have long taken a rather foolish pride in thinking ourselves miraculous, unparalleled and marvellously fortuitous beings, probably coming from another world, having no definite ties with the rest of life and, in any case, endowed with an unusual, incomparable, monstrous aptitude. It is greatly preferable to be less prodigious, for we have learnt that prodigies do not take long to disappear in the normal evolution of nature. It is much more comforting to observe that we follow the same road as the soul of this great world, that we have the same ideas, the same hopes, the same trials and—were it not for our specific dream of justice and pity—the same feelings. It is much more consoling to assure ourselves that, to better our lot, to utilize the forces, the occasions, the laws of matter, we employ methods exactly similar to those which it uses to enlighten and sway its unconscious and unruly regions, that there are no other methods, that we are in the right and that we are in our proper place and at home in this universe formed of unknown substances, whose.

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thought, however, is not impenetrable and hostile, but analogous and comformable to ours.

If nature knew everything, if she were never wrong, if, everywhere, in all her undertakings, she showed herself perfect and infallible at the first onset, if she revealed in all things an intelligence immeasurably superior to our own, then indeed there might be cause to fear and to lose courage. We should feel ourselves the victim and the prey of an extraneous power, which we should have no hope of knowing or measuring. It is much better to be convinced that this power, at least from the intellectual point of view, is close akin to our own. Nature's intelligence and ours draw upon the same reserves. We belong to the same world, we are almost equals. We are associating not with inaccessible gods, but with veiled, yet fraternal intentions which it is our business to grasp and to direct.

30

It would not, I imagine, be very rash to maintain that there are not creatures more or less intelligent, but a diffused, general intelligence, a sort of universal fluid that penetrates diversely the organisms which it encounters, according as they are good or bad conductors of the understanding. Man, in that

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case, would hitherto represent, upon this earth, the mode of life that offers the least resistance to this fluid, which the religions named divine. Our nerves would be the wires along which this more subtle electricity would travel. The circulations of our brain would, in a manner, form the induction-coil wherein the force of the current would be multiplied; but this current would be of no other nature, would proceed from no other source than that which passes through the stone, the star, the flower or the animal.

But these are mysteries which it were somewhat idle to interrogate, seeing that we do not yet possess the organ that could gather their reply. Let us be satisfied with having observed certain manifestations of this intelligence outside ourselves. All that we observe within ourselves is rightly open to suspicion: we are at once litigant and judge and we have too great an interest in peopling our world with magnificent illusions and hopes. But let the least external indication be dear and precious to us. Those which the flowers have just offered us are probably infinitesimal compared with what the mountains, the sea and the stars would tell us, could we surprise the secrets of their life. Nevertheless, they allow us to presume with greater confidence that the spirit which

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quickness all things or emanates from them is of the same essence as that which quickens our bodies. If this spirit resembles us, if we thus resemble it, if all that it contains is contained also within ourselves, if it employs our methods, if it has our habits, our preoccupations, our tendencies, our desires for better things, is it illogical for us to hope all that we instinctively and invincibly do hope, seeing that it is almost certain that it hopes the same? Is it likely, when we find so great a sum total of intelligence, scattered throughout life, that this life should perform no work of intelligence, that is to say, should not pursue an aim of happiness, of perfection, of victory over that which we call evil, death, darkness, annihilation, but which is probably only life's sleep or the shadow of its face?

PERFUMES

PERFUMES

I

AFTER speaking at some length of the intelligence of the flowers, it will seem natural that we should say a word of their soul, which is their perfume. Unfortunately, here, as in the case of the soul of man, a perfume of another sphere, where reason bathes, we have at once to do with the unknowable. We are almost entirely unacquainted with the purpose of that zone of festive and invisibly magnificent air which the corollas shed around themselves. There is, in fact, a great doubt whether it serves chiefly to attract the insects. In the first place, many among the most sweet-scented of the flowers do not admit of cross-fertilization, so that the visit of the butterfly or the bee is to them a matter of indifference or annoyance. Next, that which attracts the insects is solely the pollen and the nectar, which, generally, have no perceptible odour. And thus we see them neglect the most deliciously perfumed flowers, such as the rose and the carnation, to besiege in crowds the flowers of the maple or the hazel-tree, whose aroma is, in a manner of speaking, null.

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Let us, then, confess that we do not yet know in what respect perfumes are useful to the flower, even as we cannot tell why we ourselves perceive them. Indeed, of all our senses, that of smell is the most unexplained. It is evident that sight, hearing, touch and taste are indispensable to our animal existence. Only by long training do we learn to enjoy forms, colours and sounds for their own sakes. However, our sense of smell also exercises important servile functions. It is the custodian of the air we breathe, the chemist or hygienic specialist that watches carefully over the quality of the food offered for our consumption, any disagreeable emanation revealing the presence of suspicious or dangerous germs. But besides this practical mission it has another which serves no apparent purpose. Perfumes are utterly useless to the needs of our material life. When too violent or too lasting, they may even become detrimental to it. Nevertheless, we possess a faculty that revels in them and brings us the joyful tidings of them with as much enthusiasm and conviction as though it concerned the discovery of a delicious fruit or beverage. This uselessness deserves our consideration. It must hide some fair secret. We have here the only instance in which nature procures us a gratuitous pleasure, a satisfaction that does not serve to gild one of neces-

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sity's snares. Our sense of smell is the one sheerly luxurious sense that she has granted us. Wherefore it seems almost foreign to our bodies and appears but remotely connected with our organism. Is it an instrument that is developing, or one that is becoming atrophied; a somnolent, or an awakening faculty? Everything suggests that evolving simultaneously with our civilization. The ancients were interested almost exclusively in the more violent, the heavier, the more solid scents, so to speak: musk, benzoin, myrrh and frankincense; and the fragrance of the flowers is very seldom mentioned in Greek and Latin poetry or in Hebrew literature. To-day, do we ever see our peasants, even at their longest periods of leisure, dream of smelling a violet or a rose? And is not this, on the other hand, the very first act of an inhabitant of our great cities who perceives a flower? There is, therefore, some ground for admitting that the sense of smell is the last-born of our senses, the only one, perhaps, that is not "on the retrograde path," to use the ponderous phrase of the biologist. This is a reason for making it our study, questioning it and cultivating its possibilities. Who shall tell the surprises which it would have in store for us if it equalled, for instance, the perfection of our sight, as it does in the case of

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the dog, which lives as much by the nose as by the eyes?

We have here an unexplored world. This mysterious sense, which, at first sight, appears almost foreign to our organism, becomes, perhaps, when more carefully considered, that which enters into it most intimately. Are we not, above all things, creatures of the air? Is the air not for us the most absolutely and urgently indispensable element; and is not our sense of smell just the one sense that perceives some parts of it? Perfumes, which are the jewels of that life-giving air, do not adorn it without good cause. It were not surprising if this luxury which we do not understand corresponded with something very profound and very essential and, as we have seen, with something that is not yet rather than something that has ceased to be. It is very possible that this sense, the only one directed towards the future, is already grasping the most striking manifestations of a form or of a happy and salutary state of matter that is reserving many a surprise for us.

Meanwhile, it has not yet reached beyond the stage of the more violent, the less subtle perceptions. Hardly does it so much as suspect, with the aid of the imagination, the profound and harmonious effluvia that evidently envelop the great spectacles of the atmosphere and the light. As we are on the

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point of distinguishing those of the rain or the twilight, why should we not one day succeed in recognizing and establishing the scent of snow, of ice, of morning dew, of early dawn, of the twinkling of the stars? Everything in space must have its perfume, as yet past comprehension: even a moonbeam, a ripple on the water, a soaring cloud, an azure smile of the sky. . . .

Chance or rather deliberate choice has lately led me back to the spot where almost all the perfumes of Europe are born and brought to perfection. It is, in point of fact, as every one knows, in the sun-swept region between Cannes and Nice that the last hills and the last valleys of live and true flowers maintain an heroic struggle against the coarse chemical odours of Germany, which stand in exactly the same relation to nature's perfumes as to the painted woods and plains of a theatre to the woods and plains of the real country. Here, the peasant's work is ruled by a sort of purely floral calendar, in which, in May and July, two adorable queens hold sway: the rose and the jasmine. Around these two sovereigns of the year, one the hue of the dawn, the other arrayed in white stars,

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circle, from January to December, the innumerable and eager violets, the riotous jonquils, the artless, wide-eyed narcissus, the clustering mimosa, the mignonette, the pink laden with precious spices, the compelling geranium, the aggressively-virginal orange-flower, the lavender, the Spanish broom, the too-potent tuberose and the *cassie*, which is a species of acacia and bears a flower resembling an orange caterpillar.

It is, at first, not a little incongruous to see those tall thick-set, heavy rustics, whom harsh necessity turns every elsewhere from the smiles of life, taking flowers thus seriously, handling carefully those fragile ornaments of the earth, performing a task fit for a princess or a bee and bending under a weight of violets or jonquils. But the most striking impression is that of certain evenings or mornings in the season of the roses or the jasmine. It is as though the atmosphere of the earth had suddenly changed, as though it had made way for that of an infinitely happy planet, where perfumes are not, as here, fleeting, vague and precarious, but stable, spacious, full, permanent, generous, normal and inalienable.

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have—at least, so I imagine—drawn a picture of that almost fairy-like industry which occupies the whole of a hard-working town, perched, like a sunlit hive, upon a mountain-side. They must have sung of the glorious cartloads of roses shot upon the threshold of the smoking factories, the great halls in which the sorters literally waded through the flood of petals, the less cumbersome, but more precious arrival of the violets, tuberoses, acacia, jasmine, in great baskets which the peasant-women carry proudly on their heads. They must have described the different processes whereby the flowers, each according to its character, are forced to yield to the crystal the marvellous secrets of their hearts. We know that some of them, the roses, for instance, are accommodating and willing and surrender their aroma by simple methods. They are heaped into huge boilers, tall as those of our locomotive-engines, through which steam passes. Little by little, their essential oil, more costly than molten pearls, oozes drop by drop into a glass tube, no wider than a goosequill, at the bottom of the still, which resembles a monster painfully giving birth to a bead of amber.

But the greater part of the flowers do not so easily allow their souls to be imprisoned. I will not speak here of the in-

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finitely varied tortures inflicted upon them to force them at length to surrender the treasure which they desperately conceal in their corollas. It will suffice, to give an idea of the executioner's cunning and the obstinacy of some of the victims, to recall the pangs of the cold enfleurage which certain flowers—the jonquil, the mignonette, the tuberose and the jasmine—are made to endure before they break silence; and I may mention, in passing, that the scent of the jasmine is the only one that is not to be imitated, the only one that cannot be obtained by an ingenious blending of other odours.

Large plates of glass are coated with a bed of white fat two fingers deep; and the whole is thickly covered with flowers. As the result of what hypocritical manœuvres, of what unctuous promises does the fat obtain their irrevocable confidences? The fact remains that soon the too-trusting flowers have nothing left to lose. Forthwith, each morning, they are removed and thrown on the rubbish-heap; and a fresh batch of innocents takes their place on the insidious couch. These yield in their turn and undergo the same fate; more and yet more follow them. It is not until the end of three months, that is after devouring ninety successive generations of flowers, that the greedy and captious fat, saturated with fragrant

JASMINE



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surrenders and confidences, refuses to despoil any further victims.

As for the violets, they resist the importunities of the cold fat; the torture of fire has to be superadded. The lard, therefore, is heated in the *bain-marie*. In consequence of this barbarous treatment, the sweet and modest flowers that deck the roads in spring gradually lose the strength to keep their secret. They yield, they give themselves; and their liquid executioner is not satiated until it has absorbed four times its own weight in petals, which causes the torture to be prolonged throughout the season in which the violets blossom under the olive-trees.

But the tragedy is not over. It is now a matter of compelling the greedy fat, whether it be hot or cold, to disgorge; for it means, with all its shapeless and evasive energy, to retain the absorbed treasure. The object is achieved, not without difficulty. The fat has base passions which are its undoing. It is plied with alcohol, is intoxicated and ends by quitting its hold. The alcohol now possesses the mystery. No sooner are the secrets in its custody than it too claims the right to impart them to none other, to keep them for itself alone. It is attacked in its turn, reduced, evaporated, condensed; and, after all these adventures, the liquid pearl, pure, essential,

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inexhaustible and almost imperishable, is at last gathered on a crystal blade.

I will not enumerate the chemical processes of extraction, by means of petrol ether, sulphide of carbon and the rest. The great perfumers of Grasse, ever loyal to tradition, scorn these artificial and almost unfair methods, which yield none but pungent scents and wound the soul of the flower.

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I

I HAVE seen how Spring stores up sunshine, leaves and flowers and makes ready, long beforehand, to invade the North. Here, on the ever-balmy shores of the Mediterranean—that motionless sea which looks as though it were under glass—where, while the months are dark in the rest of Europe, Spring has taken shelter from the wind and the snows in a palace of peace and light and love, it is interesting, in the fields of undying green, to detect its preparations for travelling. I can see clearly that it is afraid, that it hesitates to face once more the mighty frost-traps which February and March annually lay for it beyond the mountains. It waits, it dallies, it tries its strength before resuming the harsh and cruel road which the hypocrite Winter seems to yield to it. It stops, sets out again, revisits a thousand times, like a child running round the garden of its holidays, the fragrant valleys, the tender hills which the frost has never brushed with its wings. It has nothing to do here, nothing to revive, since nothing has perished and nothing suffered, since all the flowers of every

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season bathe here in the blue air of an eternal summer. But it seeks pretexts, it lingers, it loiters, it goes to and fro like an unoccupied gardener. It pushes aside the branches, caresses with its breath the olive-tree that quivers with a silver smile, polishes the glossy grass, rouses the corollas that were not asleep, recalls the birds that had never fled, encourages the bees that were workers without ceasing; and then, seeing, like God, that all is well in the spotless Eden, it rests for a moment on the ledge of a terrace which the orange-tree crowns with formal blossoms and with radiant fruits; and, before leaving, rests a last look upon its labour of joy and entrusts it to the sun.

2

I have followed it, these past few days, on the banks of the Borigo, from the torrent of Carei to the Val de Gorbio; in those little rustic towns, Ventimiglia, Tenda, Sospello; in those curious villages, perched upon their rock, Castellar, Sant' Agnese, Castillon; in that adorable and already quite Italian country which surrounds Mentone. You pass through a few streets quickened with the cosmopolitan and somewhat hateful life of the Riviera; you leave behind you the band-

ALMOND BLOSSOMS



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stand, with its everlasting town music, around which gather the consumptive rank and fashion of Mentone; and behold, at two steps from the crowd that dreads it as it would a scourge from Heaven, you find the admirable silence of the trees, with all the goodly Virgilian realities of sunk roads, clear springs, shady pools that sleep on the mountain-slopes, where they seem waiting to reflect a goddess. You climb a path between two walls of stone brightened by violets and crowned with the strange brown cowls of the arisarum, which has leaves of so deep a green that one might believe them to be created to symbolize the coolness of the wells; and the amphitheatre of a valley opens like a moist and splendid flower. Through the blue veil of the giant olive-trees, which cover the horizon with a transparent curtain of shimmering pearls, shines the discreet and harmonious glamour of all that men imagine in their dreams and paint upon scenes that are thought unreal and unrealizable, when they wish to define the ideal gladness of an immortal hour, of some enchanted island, of a lost paradise or the abode of the gods.

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amphitheatres which are as stages whereupon, by moonlight or amid the peace of the mornings and afternoons, are enacted the dumb fairy-plays of the world's happiness. They are all alike; and yet each of them reveals a different bliss. Each of them, as though they were the faces of a bevy of equally happy and equally beautiful sisters, wears its distinguishing smile. A cluster of cypresses, clear-cut against the sky; a mimosa like a bubbling spring of sulphur; a grove of orange-trees with dark and heavy tops symmetrically weighted with golden fruits that suddenly proclaim the royal affluence of the soil that feeds them; a slope covered with lemon-trees, where the night seems to have heaped up on a mountain-side, to await a new twilight, the stars gathered by the dawn; a leafy portico opening over the sea like a deep glance that suddenly discloses an infinite thought; a brook half-hidden like a tear of joy; a trellis ready to receive the purple of the grapes; a great stone basin drinking the water that trickles from the tip of a green reed: all and yet none enhance the expression of the restfulness, the tranquillity, the azure silence and the blissfulness that is a delight unto itself.

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steps. Where is it hiding? It should be here; and how dares this feast of roses and anemones, of soft air and dew, of bees and birds proceed with such assurance during the most pitiless months of Winter's reign? And what will Spring do, what will Spring say, since all seems done, since all seems said? Is it superfluous, then, and is there nothing that awaits its coming?

Search carefully: you shall find amid this life of unwearying youth the work of its hand, the perfume of its breath which is younger than life. Thus, there are foreign trees yonder, taciturn guests, like poor relations in ragged attire. They come from very far, from the land of fog and frost and wind. They are aliens, sullen and distrustful. They have not yet learned the limpid speech, not adopted the delightful customs of the South. They refused to believe the promise of the sky and suspected the caresses of the sun, which, from early dawn, covers them with a mantle of silkier and warmer rays than that wherewith July loaded their shoulders in the precarious summers of their native land. It made no difference: at the given hour, when snow was falling a thousand miles away, their trunks shivered and, despite the bold avowal of the grass and a hundred thousand flowers, despite

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the impertinence of the roses that climb up to them to bear witness to life, they stripped themselves for their winter sleep. Sombre and grim and bare as the dead, they await the Spring that bursts forth around them; and, by a strange and excessive reaction, they wait for it longer than under the harsh, gloomy sky of Paris, for in Paris the buds are already beginning to shoot. One recognizes them here and there amid the holiday throng whose moveless dances witch the hills. They are not many and they conceal themselves: they are gnarled oaks, beeches, plane-trees; and even the vine, which one had thought better-mannered, more docile and well-informed, remains incredulous. There they stand, dismal and gaunt, like cripples on an Easter Sunday in the church-porch made transparent by the splendour of the sun. They have been there for years: some of them, perhaps, for two or three centuries; but they have the terror of Winter in their marrow. They will never lose the habit of death. They have too much experience, they are too old to forget and too old to learn. Their hardened reason refuses to admit the light when it does not come at the accustomed time. They are rugged old men, too wise to enjoy unforeseen pleasures. They are wrong: wisdom should not prohibit the finer indiscretions. Here, around the old,

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around the grudging ancestors, is a whole world of plants that know nothing of the future, but give themselves to it. They live but for a season; they have no past and no traditions and they know nothing, save that the hour is fair and that they must enjoy it. While their elders, their masters and their gods, waste their time in sulking, these burst into flower; they love and they beget. They are the humble flowers of sweet solitude: the daisy that covers the sward with its artless and methodical neatness; the borage bluer than the bluest sky; the scarlet or many-hued anemone; the maidenly primrose; the branching mallow; the campanula, shaking bells which no one hears; the rosemary that looks like a little country serving-maid; and the pungent thyme that thrusts its grey head between the broken stones.

But, above all, this is the incomparable hour, the diaphanous and liquid hour of the wood-violet. Its verbal humility becomes arrogant and almost intolerant. It no longer cowers timidly among the leaves: it hustles the grass, overtops it, blots it out, forces its colours upon it, fills it with its breath. Its unnumbered smiles cover the terraces of vines, olive-trees, the slopes of the ravines, the bend of the valleys with a net of sweet and innocent gaiety; its perfume, fresh and pure as the souls

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of the springs that flow under the hills, makes the air more translucent, the silence more limpid and is, in very deed, as a forgotten legend tells us, the breath of Earth, all bathed in dew, when, a virgin yet, she wakes in the sun and yields herself wholly in the first kiss of early dawn.

5

Again, in the little gardens that surround the cottages, the bright little houses with their Italian roofs, the good, kindly vegetables, unprejudiced and unpretentious, have never known a doubt, a fear. While the old peasant who has come to resemble the trees he cultivates, digs the earth around the olives, the spinach assumes a lofty bearing, hastens to grow green nor takes the least precaution; the bean opens its eyes of jet in its pale leaves and sees the night fall unmoved; the flighty peas shoot and lengthen out, covered with staid and steadfast butterflies, as though June had entered the farm-gate; the carrot blushes as it faces the light; the ingenuous strawberry-plants inhale the aroma which noontide lavishes upon them as it bends to earth its sapphire urns; the lettuce exerts itself to achieve a heart of gold wherein to lock the dews of morn and eve.

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The fruit-trees alone have long reflected: the example of the vegetables among which they live urged them to take part in the general rejoicing, but the rigid attitude of their elders from the North, of the grandparents born in the great dark forests, preached prudence to them. Nevertheless, they awaken: they too can resist no longer and at last make up their minds to join the dance of perfumes and of love. The peach-trees are now no more than a rosy miracle: they suggest the softness of a child's skin turned into azure vapour by the breath of dawn. The pear-, the plum-, the apple-, the almond-tree make dazzling efforts in drunken rivalry; and the pale hazel-trees, like Venetian chandeliers, resplendent with a cascade of gems, stand here and there to light the feast.

As for the luxurious flowers that seem to possess no other object than themselves, they have long abandoned the endeavour to fathom the mystery of this boundless summer. They no longer score the seasons, no longer count the days; and, knowing not what to do in the glowing disarray of hours that have no shadow, dreading lest they should be deceived and lose a single second that might be fair, they have resolved to bloom without respite from January to December. Nature approves them and, to reward their trust in happiness, their

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generous beauty and their amorous excesses, grants them a force, a brilliancy and perfumes which she never gives to those which hang back and show a fear of life.

All this, among other truths, was proclaimed by the little house that I saw to-day on the side of a hill all deluged in roses, carnations, wall-flowers, heliotrope and mignonette, so as to suggest the source, choked and overflowing with flowers, whence Spring was preparing to pour down upon us; while, upon the stone threshold of the closed door, water-melons, lemons, oranges, limes and Turkey figs slumbered peacefully in the steel-blue shade and amid the majestic, deserted, monotonous silence of a perfect day.

FIELD FLOWERS

FIELD FLOWERS

I

THEY greet our steps without the city gates, on a gay and eager carpet of many colours, which they wave madly in the sun. It is evident that they were expecting us. When the first bright rays of March appeared, the Snowdrop or Winter-bell, the heroic daughter of the hoarfrost, sounded the reveille. Next sprang from the earth efforts, as yet shapeless, of a slumbering memory, vague ghosts of flowers, pale flowers that are scarcely flowers at all: the Three-fingered or Rue-leaved Saxifrage; the almost invisible Shepherd's Purse; the Two-leaved Squill; the Bear's-foot, or Stinking Hellebore; the Colt's-foot; the gloomy and poisonous Spurge Laurel: all of them ailing and sickly; undecided pale-blue and pale-pink attempts; life's first fever, wherein nature voids her malignant humours; anæmic captives released by Winter's hand; convalescents from the subterranean prisons; timid and unskilled endeavours of the shrouded light.

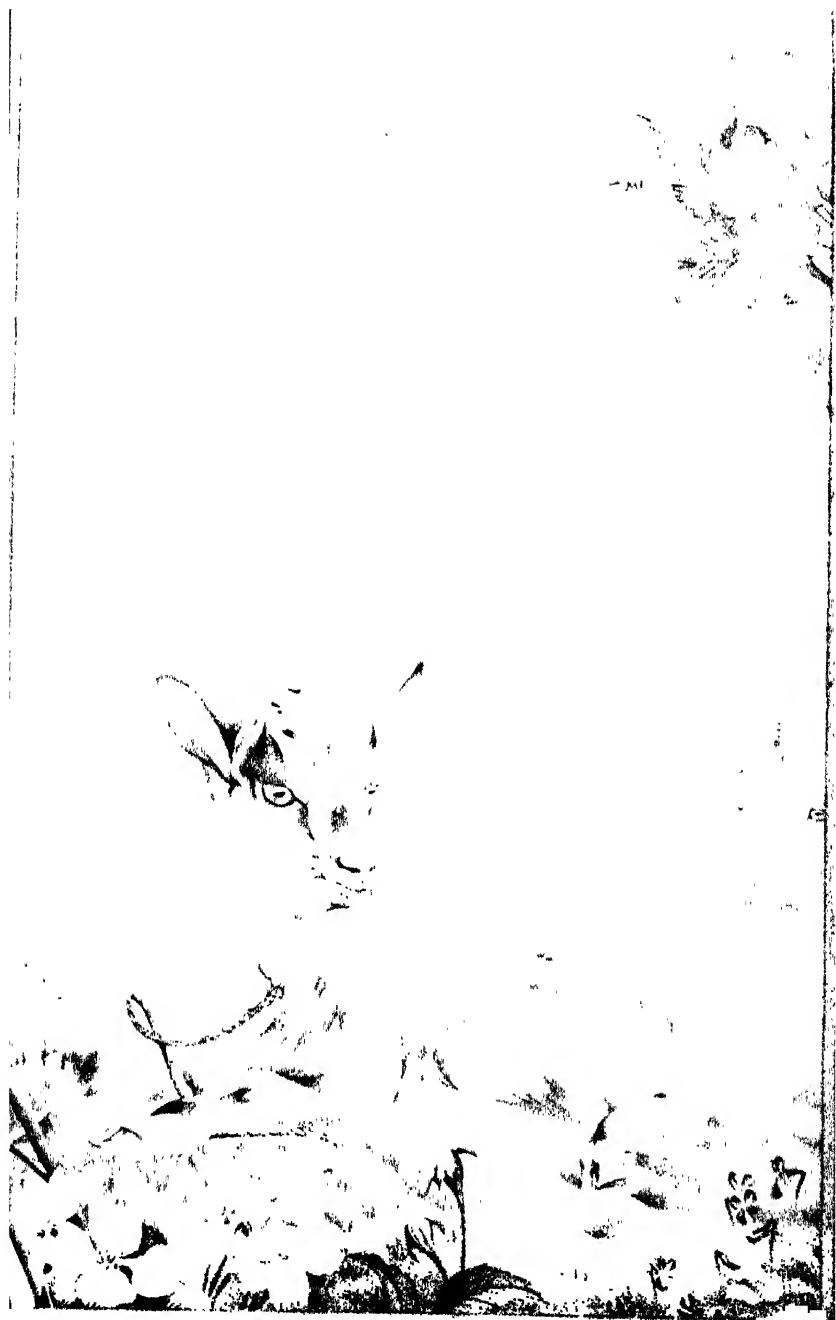
But soon the light adventures into space; the nuptial thoughts of the earth become clear and pure; the rough at-

NEWS OF SPRING

tempts disappear; the half-dreams of the night lift like a fog chased by the dawn; and the good rustic flowers begin their unseen revels under the blue, all around the cities where man knows them not. No matter, they are there, making honey, while their proud and barren sisters, who alone receive our care, are still trembling in the hothouses. And they will be there, just the same, in the flooded fields, in the sunken paths and adorning the roads with their simplicity, when the first snows shall have covered the countryside. No one sows them and no one gathers them. They survive their renown and man treads them under foot. Formerly, however, and not long ago, they alone represented nature's gladness. Formerly, however, a few hundred years ago, before their brilliant, chilly kinswomen had come from the West Indies, from India, from Japan, or before their own daughters, ungrateful and unrecognizable, had usurped their place, they alone brought gladness to sorrowing eyes, they alone brightened the cottage-porch, the castle-terrace and followed the lovers' footsteps in the woods. But those times are no more; and they are dethroned. They have retained of their past happiness only the names which they received when they were loved.

And those names show all that they were to man: all his

SPRING



FIELD FLOWERS

gratitude, his studious fondness, all that he owed them, all that they gave him are there contained, like an enduring aroma held in hollow pearls. And so they bear names of queens, shepherdesses, virgins, princesses, sylphs and fairies, which flow from the lips like a caress, a lightning-flash, a kiss, a murmur of love. Our language, I think, contains nothing that is better-, more daintily-, more lovingly-named than these homely flowers. Here the word clothes the idea almost always with care, with light precision, with wonderful aptness. It is like an ornate and transparent drapery that moulds the form which it embraces and has the proper shade, perfume and sound. Call to mind the Daisy, the Violet, the Bluebottle, the Poppy, or, rather, Coquelicot: the name is the flower itself. How marvellous, for instance, that sort of cry and crest of light and joy, "Coquelicot!" to designate the scarlet flower which the scientists crush under this barbarous title: "*Papaver rhæas!*" See the Primrose, or Primula, the Periwinkle, the Anemone, the Wild Hyacinth, the blue Speedwell, or Veronica, the Forget-me-not, the Wild Bindweed, or Convolvulus, the Iris, the Harebell, or Campanula: their name depicts them by equivalents and analogies which the greatest poets but rarely light upon. It

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represents all their ingenuous and visible soul. It hides itself, stoops, rises to the ear even as those who bear it lie concealed, bend forward, or stand erect in the corn and in the grass.

These are the few names that are known to all of us; we do not know the others, though their music describes with the same gentleness, the same happy genius, flowers which we see by every wayside and upon all the paths. Thus, at this moment, that is to say at the end of the month in which the ripe corn falls beneath the reaper's sickle, the banks of the roads are a pale violet: it is the sweet and gentle Scabious, who has blossomed at last, discreet, aristocratically poor and modestly beautiful, as her title, that of a mist-veiled precious stone, proclaims. Around her, a treasure lies scattered: it is the *Ranunculus*, or Buttercup, who has two names, even as he has two lives; for he is at once the virgin innocent who covers the grass with sunflake and the fearsome and venomous wizard who deals out death to heedless animals. Again we have the Yarrow and the Sneezewort, little flowers, once useful, that march along the roads like silent school-girls, clad in a dull uniform; the vulgar and innumerable Bird's Groundsel; her big brother, the Lamb's Lettuce of the fields; then the dangerous Black Nightshade; the Bitter-sweet, who hides



FIELD FLOWERS

herself; the creeping Dock-leaved Knotgrass: all the dowdy families, wearing with a resigned smile the grey and practical livery of Autumn, which already is felt to be at hand.

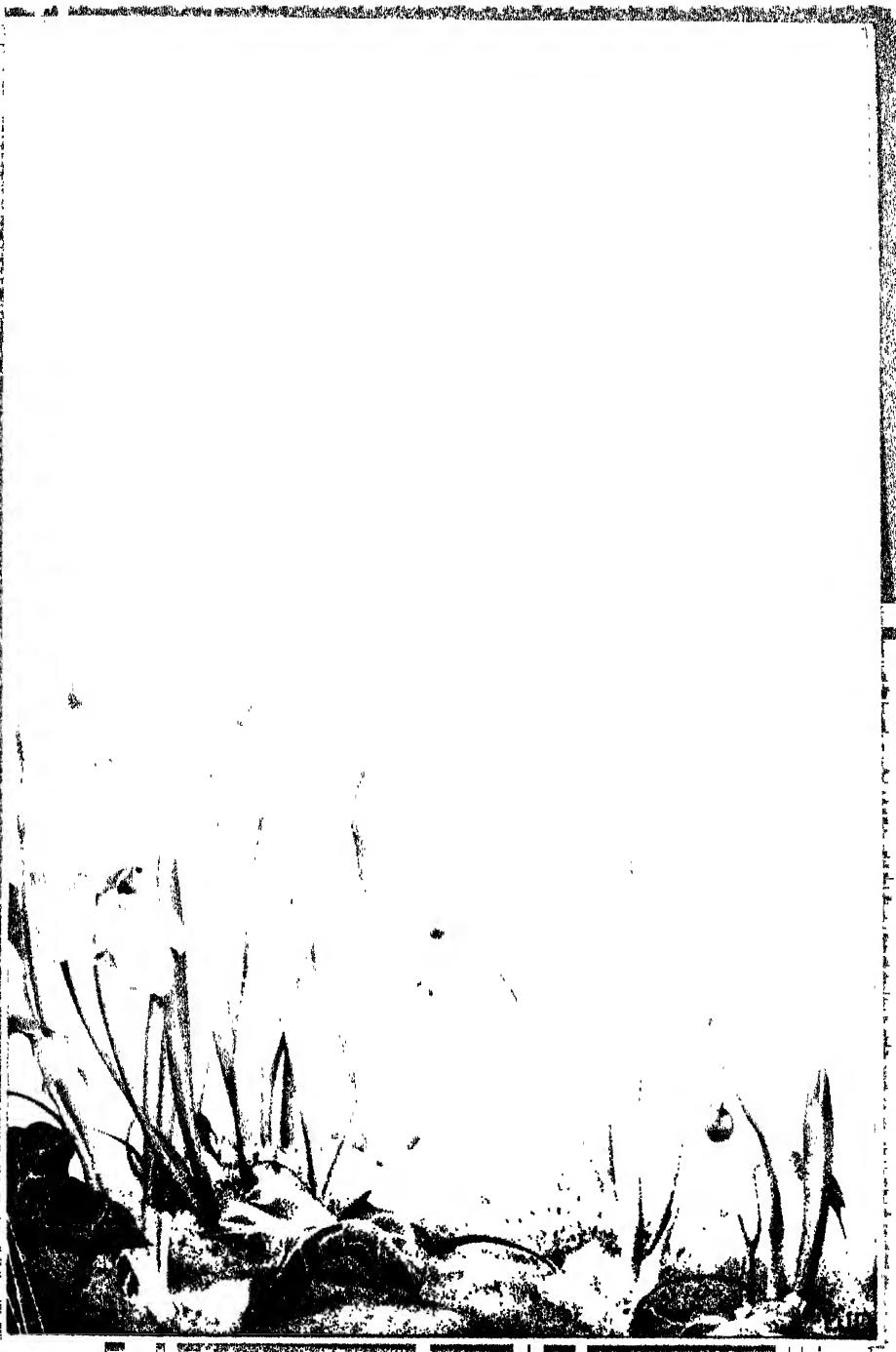
2

But, among those of March, April, May, June, July, remember the glad and festive names, the springtime syllables, the vocables of azure and dawn, of moonlight and of sunshine! Here is the Snowdrop, or Winter-bell, who heralds the thaw; the Stitchwort, or Satin-flower, who greets the first-communicants along the hedgerows with their leaves as yet indeterminate and uncertain, like a diaphanous green mist. Here are the Wild Sage and the drooping Columbine; the Elecampane, the Sheep's-bit, the Angelica, the Fennel-flower; the Gilly-flower, dressed like the servant of a village-priest; the Osmond, who is a king fern; the Wood-rush, the Wall Parmelia, the Venus' Looking-glass; the Esula or Wood Surge, mysterious and full of smouldering fire; the Winter Cherry, whose fruit ripens in a red lantern; the Henbane, the Deadly Nightshade, the Foxglove: poisonous queens, veiled Cleopatras of the untilled places and the cool woods. And then, again, the Chamomile, the good capped Sister with a

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thousand smiles, bringing the health-giving brew in an earthenware bowl; the Pimpernel and the Coronilla, the cold Mint and the purple Thyme, the Sainfoin and the Eyebright, the Moon flower, or Ox-eye Daisy, the mauve Gentian and the blue Verbena, the lance-shaped Horsetail, the Cinquefoil, or Potentilla, the Greenweed, or Dyer's Broom. . . . To tell their names is to recite a poem of grace and light. We have reserved for them the most charming, the purest, the clearest sounds and all the musical gladness of the language. One would think that they were the persons of a play, the dancers and choristers of an immense fairy-scene, more beautiful, more startling and more supernatural than the scenes that unfold themselves on Prospero's Island, at the Court of Theseus or in the Forest of Arden. And the fair actress in this dumb and endless comedy—goddesses, angels, she-devils, princesses and witches, virgins and courtezans, queens and shepherd-girls—carry in the folds of their names the magic sheen of innumerable dawns, of innumerable springtimes witnessed by forgotten men, even as they also carry the memory of thousands of deep or fleeting emotions which were felt before them by generations that have disappeared, leaving no other trace.

SNOWDROPS



FIELD FLOWERS

3

They are interesting and incomprehensible. They are vaguely called the "Weeds." They serve no purpose. Here and there, a few, in very old villages, retain the spell of contested virtues. Here and there, one of them, down at the bottom of the apothecary's or herbalist's jars, still awaits the coming of the sick man faithful to the infusions of tradition. But sceptic medicine will have none of them. No longer are they gathered according to the olden rites; and the science of "Simples" is dying out in the housewife's memory. A merciless war is waged upon them. The husbandman fears them; the plough pursues them; the gardener hates them and has armed himself against them with clashing weapons: the spade and the rake, the hoe and the scraper, the weeding-hook, the mattock. Along the highroads, their last refuge, the passer-by crushes and the waggon bruises them. In spite of all, they are there: permanent, assured, teeming, peaceful; and not one but answers the summons of the sun. They follow the seasons without swerving by an hour. They take no account of man, who exhausts himself in conquering them, and, so soon as he rests, they spring up in his footsteps. They live on, audacious, immortal, untamable. They have peopled our flower-beds

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with extravagant and unnatural daughters; but they, the poor mothers, have remained what they were a hundred thousand years ago. They have not added a fold to their petals, re-ordered a pistil, altered a shade, nor invented a new perfume. They keep the secret of a stubborn mission. They are the indelible primitives. The soil is theirs since its origin. They represent, in brief, an invariable thought, an obstinate desire, an essential smile of the Earth.

That is why it is well to question them. They have evidently something to tell us. And, then, let us not forget that they were the first—with the sunrises and the autumns, with the springs and the sunsets, with the song of the birds, with the hair, the glance and the divine movements of women—to teach our fathers that there are useless and beautiful things upon this globe. . . .

CHRYSANTHEMUMS

CHRYSANTHEMUMS

I

EVERY year, in November, at the season that follows on the hour of the dead, the crowning and majestic hour of Autumn, reverently I go to visit the chrysanthemums in the places where chance offers them to my sight. For the rest, it matters little where they are shown to me by the good will of travel or of sojourn. They are, indeed, the most universal, the most diverse of flowers; but their diversity and surprises are, so to speak, concerted, like those of fashion, in arbitrary Edens. At the same moment, even as with silks, laces, jewels and curls, a voice composed of sky and light gives the password in time and space; and, docile as the most beautiful of women, simultaneously, in every country, in every latitude, the flowers obey the sacred decree.

It is enough, then, to enter at random one of those crystal museums in which their somewhat funereal riches are displayed under the harmonious veil of a November day. We at once grasp the dominant idea, the obtrusive beauty, the conscious effort of the year in this special world, strange and

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privileged even in the midst of the strange and privileged world of flowers. And we ask ourselves if this new idea is a profound and really necessary idea on the part of the sun, the earth, life, autumn, or man.

2

Yesterday, then, I went to admire the year's gentle and gorgeous floral feast, the last which the snows of December and January, like a broad belt of peace, sleep, silence and oblivion, separate from the delicious festivals that commence again with the germination, powerful already, though hardly visible, that seeks the light in February.

They are there, under the immense transparent domes, the noble flowers of the month of fogs; they are there, at the royal meeting-place, all the grave Autumn fairies, whose dances and attitudes seem to have been struck motionless with a magic word. The eye that recognizes them and has learned to love them perceives, at the first pleased glance, that they have actively and dutifully continued to evolve towards their uncertain ideal. Go back for a moment to their modest origin: recall the poor buttercup of not so long ago, the humble little blush-red or damask rose that still smiles sadly in the scanty



CHRYSANTHEMUMS

garden-patches of our villages, beside the roads filled with dead leaves; compare with them these enormous masses and fleeces of snow, these disks and globes of red copper, these spheres of old silver, these trophies of alabaster and amethyst, this delirious prodigy of petals which seems to be trying to exhaust to its last riddle the world of autumnal shapes and shades which Winter entrusts to the bosom of the sleeping woods; let the unwonted and unexpected varieties pass before your eyes; admire and appraise them.

Here, for instance, is the marvellous family of the stars: flat stars, bursting stars, diaphanous stars, solid and fleshy stars, milky ways and constellations of the earth that correspond with those of the firmament. Here are the proud egret-plumes that await the diamonds of the dew; here, to put our dreams to shame, the fascinating poem of unreal tresses: mad and miraculous tresses; honeyed moonbeams, golden bushes, and flaming whirlpools; curls of fair and smiling maidens, of fleeing nymphs, of passionate bacchantes, of swooning sirens, of cold virgins, of frolicsome children, which angels, mothers, fauns, lovers have caressed with their calm or quivering hands. And then here, pell-mell, are the monsters that cannot be classed: hedgehogs, spiders, frizzles, curly endives, pine-

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apples, pompons, rosettes, shells, vapours, breaths, stalactites of ice and falling snow, a throbbing hail of sparks, wings, chips, fluffy, pulpy, fleshy things, wattles, bristles, funeral piles and sky-rockets, bursts of light, a stream of fire and sulphur. . . .

3

Now that the shapes have capitulated comes the question of conquering the region of the proscribed colours, of the reserved shades, which Autumn, it would seem, denies to the flowers that represent it. Lavishly it bestows on them all the wealth of the twilight and the night, all the riches of the vintage-time: it gives them all the mud-brown work of the rain in the woods, all the silvery fashionings of the mist in the plains, of the frost and snow in the gardens. It permits them, above all, to draw at will upon the inexhaustible treasures of the dead leaves and the expiring forest. It allows them to deck themselves with the golden sequins, the bronze medals, the silver buckles, the copper spangles, the fairy feathers, the powdered amber, the burnt topazes, the neglected pearls, the smoked amethysts, the calcined garnets, all the dead but still resplendent jewellery which the north wind heaps up in the hollow of ravines and ruts; but it insists that they shall remain

CHRYSANTHEMUMS

faithful to their old masters and wear the livery of the drab and weary months that give them birth. It does not permit them to betray those masters and to don the princely shot garments of Spring and sunrise; and, if, sometimes, it suffers a pink, this is only on condition that it be borrowed from the cold lips, the pale brow of the veiled and afflicted virgin praying on a tomb. It forbids most strictly the tints of Summer, of too youthful, ardent and serene a life, of a health too joyous and exuberant. In no case will it consent to hilarious vermilions, impetuous scarlets, imperious and dazzling purples. As for the blues, from the azure of the dawn to the indigo of the sea and the deep lakes, from the periwinkle to the borage and the larkspur, they are banished under pain of death.

4

Nevertheless, thanks to some inadvertence on the part of nature, the most unusual colour in the world of flowers and the most severely forbidden, the colour which the corolla of the poisonous spurge is almost alone in wearing in the city of umbels, petals and calyces, green, the colour exclusively reserved for the servile and nutrient leaves, has penetrated within the jealously-guarded precincts. True, it has slipped

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in only by favour of a lie, as a traitor, a spy, a livid deserter. It is a forsworn yellow, cowardly steeped in the trembling azure of a moonbeam. It is still of the night and false, like the opal depths of the sea; it shows itself only in shifting patches at the tip of the petals; it is elusive and anxious, frail and deceptive, but undeniable. It has made its entrance, it exist, it asserts itself; it will be daily more fixed and more decided; and, through the breach which it has contrived in the citadels of light, all the joys and all the splendours of the banned prism will hurl themselves into the virgin domain, there to prepare unwonted feasts for our eyes. This is great tidings and a memorable conquest in the land of flowers.

5

We must not think that it is childish thus to interest one's self in the capricious forms, the unwritten shades of a flower that bears no fruit; nor must we treat those who seek to make it more beautiful or more strange as La Bruyère once treated the lover of the tulip or the plum. Do you remember the charming page?

"The lover of flowers has a garden in the suburbs, where he spends all his time from sunrise to sunset. You see him

CHRYSANTHEMUMS

standing there and would think that he had taken root in the midst of his tulips before his 'Solitaire;' he opens his eyes wide, rubs his hands, stoops down and looks closer at it; it never before seemed to him so handsome; he is in an ecstasy of joy and leaves it to go to the 'Orient,' then to the 'Widow,' from thence to the 'Cloth of Gold,' on to the 'Agatha,' and at last returns to the 'Solitaire,' where he remains, is tired out, sits down and forgets his dinner; he looks at the tulip and admires its shade, shape, colour, sheen and edges, its beautiful form and calyx; but God and nature are not in his thoughts, for they do not go beyond the bulb of his tulip, which he would not sell for a thousand crowns, though he will give it to you for nothing when tulips are no longer in fashion and carnations are all the rage. This rational being, who has a soul and professes some religion, comes home tired and half starved, but very pleased with his day's work; he has seen some tulips.

"Talk to another of the healthy look of the crops, of a plentiful harvest, of a good vintage, and you will find that he cares only for fruit and understands not a single word that you say; then turn to figs and melons: tell him that this year the pear-trees are so heavily laden with fruit that the branches

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almost break, that there is abundance of peaches, and you address him in a language which he completely ignores; and he will not answer you, for his sole hobby is plum-trees. Do not even speak to him of your plum-trees, for he is fond of only a certain kind and laughs and sneers at the mention of any others; he takes you to his tree and cautiously gathers this exquisite plum, divides it, gives you one half, keeps the other himself and exclaims, 'How delicious! Do you like it? Is it not heavenly? You cannot find its equal anywhere;' and then his nostrils dilate, and he can hardly contain his joy and pride under an appearance of modesty. What a wonderful person, never enough praised and admired, whose name will be handed down to future ages! Let me look at his mien and shape, while he is still in the land of the living, that I may study the features and the countenance of a man who, alone among mortals, is the happy possessor of such a plum."

Well, La Bruyère is wrong. We readily forgive him his mistake, for the sake of the pleasant window which he, alone among the authors of his time, opens upon the unexpected gardens of the seventeenth century. The fact none the less remains that it is to his somewhat bigoted florist, to his somewhat frenzied horticulturist that we owe our exquisite

CHRYSANTHEMUMS

flower-beds, our more varied, more abundant, more luscious vegetables, our ever more delicious fruits. Contemplate, for instance, around the chrysanthemums, the marvels that ripen nowadays in the humblest gardens, among the long branches wisely restrained by the patient, spreading espaliers. Less than a century ago, they were unknown; and we owe them to the innumerable and infinitesimal exertions of a legion of small seekers, all more or less hampered, all more or less absurd.

It is thus that man acquires nearly all his riches. There is nothing trivial in nature; and he who becomes impassioned of a flower, a blade of grass, a butterfly's wing, a nest, a shell, wraps his passion around a small thing that always contains a great truth. To succeed in modifying the appearance of a flower is an insignificant act in itself, if you will; but reflect upon it, for however short a while, and it becomes gigantic. In thus succeeding, do we not violate or divert profound, perhaps essential and, in any case, time-honoured laws? Do we not exceed too-easily-accepted limits? Do we not directly intrude our ephemeral will on that of the eternal forces? Does not this suggest our possession of a singular power, an almost supernatural power? And, although it is wise to

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guard against over-ambitious dreams, does not this allow us to hope that we may perhaps learn to elude or to transgress other laws no less time-honoured, more akin to ourselves and far more important? For, in the end, all things hold together; all things go hand to hand; all things obey the same invisible principles; all things share the same spirit, the same substance in the terrifying and wonderful problem; and the most modest victory gained in the matter of a flower may one day disclose to us an infinity of the untold.

6

That is why I love the chrysanthemum; that is why I follow its evolution with a brotherly interest. It is, among familiar plants, the most submissive, the most docile, the most tractable and the most attentive of all that we meet on life's long way. It bears flowers impregnated with the thought and will of man: flowers already human, so to speak. And, if the vegetable world is some day to reveal to us one of the messages that we are awaiting, perhaps it will be through this flower of the dead that we shall learn the first secret of existence, even as, in another kingdom, it is probably through the dog, the almost thinking guardian of our homes, that we shall discover the mystery of animal life. . . .

OLD-FASHIONED FLOWERS

OLD-FASHIONED FLOWERS

I

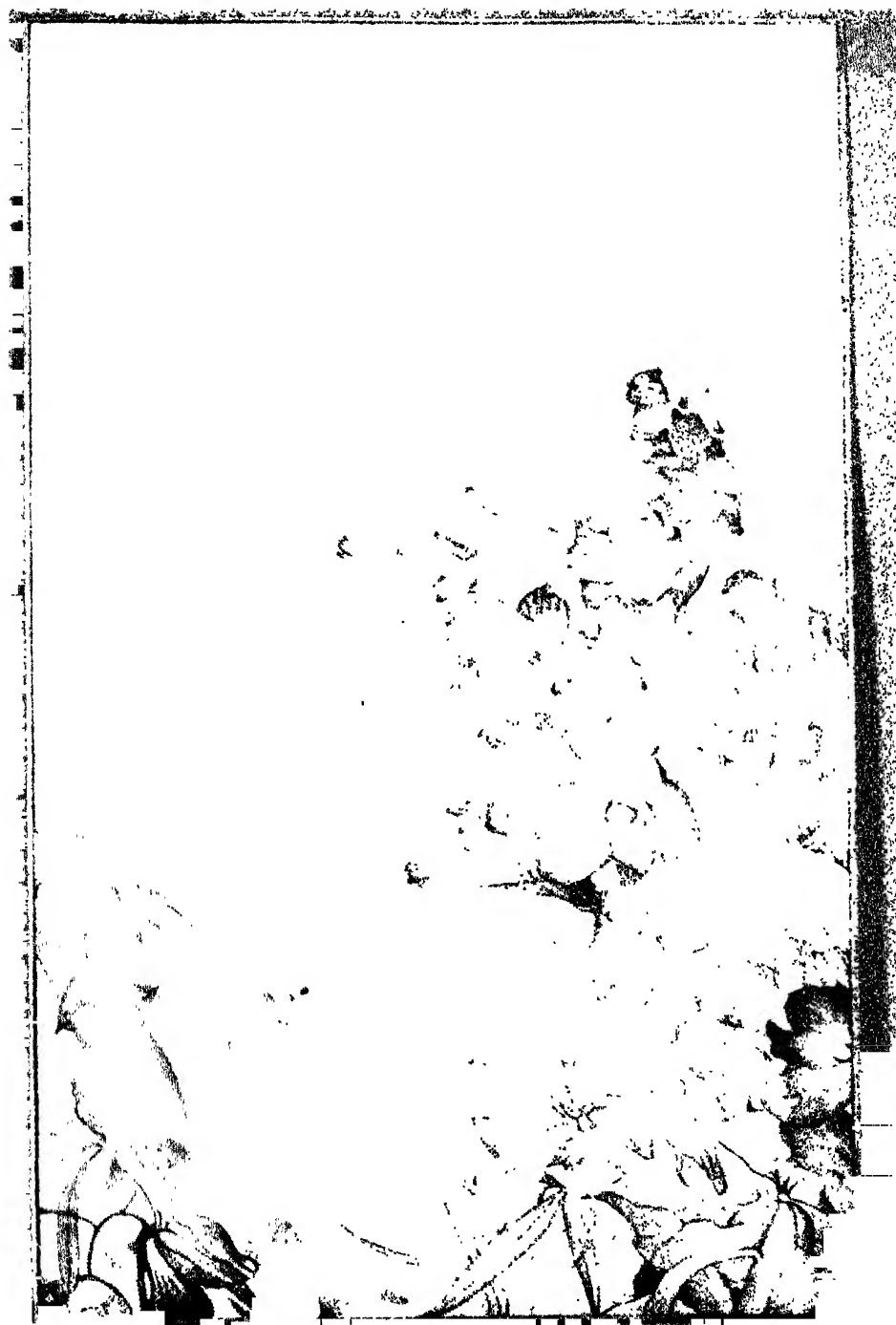
THIS morning, when I went to look at my flowers, surrounded by the white fence which protects them from the gentle cows grazing in the meadow, I saw again in my mind all that blossoms in the woods, the fields, the gardens, the orangeries and the green-houses; and I thought of all that we owe to the world of marvels which the bees visit.

Can we conceive what humanity would be if it did not know the flowers? If these did not exist, if they had always been hidden from our gaze, as are probably a thousand no less fairy sights that are all around us, but invisible to our eyes, would our character, our moral system, our sense of the beautiful, our aptitude for happiness be quite the same? We should, it is true, have other splendid manifestations of luxury, exuberance and grace in nature; other dazzling efforts of the infinite forces: sun, stars, moonlight, sky and sea, dawns and twilights, mountain and plain, forest and river, light and trees and, lastly, nearer to us, birds, precious stones and woman. These are the ornaments of our planet. Yet, save

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for the last three, which belong as it were to the same smile of nature, how grave, austere, almost sad would be the education of our eye without the softening influence which the flowers impart! Suppose, for a moment, that our globe knew them not: a great region, the most enchanted region in our happier cosmos, would be destroyed, or rather would not be discovered. All of a delightful sense would sleep for ever in our harder and more desert hearts and in our imagination stripped of worshipful images. The infinite world of colours and shades would have been but incompletely revealed to us by a few rents in the sky. The miraculous harmonies of light at play, ceaselessly inventing new joys, seeming to revel in itself, would be unknown to us; for the flowers first broke up the prism and formed the most subtle portion of our sight. And the magic garden of perfumes: who would have opened its gate to us? A few grasses, a few gums, a few fruits, the breath of the dawn, the smell of the night and the sea would have told us that beyond our eyes and ears there existed a shut paradise where the air which we breathe changes into delights for which we could have found no name. Consider also all that the voice of human happiness would lack! One of the blessed heights of our soul would be almost dumb, if

DELPHINIUMS AND FOXGLOVES



OLD - FASHIONED FLOWERS

the flowers had not, since centuries, fed with their beauty the language which we speak and the thoughts that endeavour to crystallize the most precious hours of life. The whole vocabulary, all the impressions of love are impregnate with their breath, nourished with their smile. When we love, the memories of all the flowers that we have seen and smelt hasten to people with their recognized charms the consciousness of a feeling whose happiness, but for them, would have no more form than the horizon of the sea or sky. They have accumulated within us, since our childhood and even before it, in the souls of our fathers, an immense treasure, the nearest to our joys, upon which we draw each time that we wish to make more real the clement minutes of our life. They have created and spread in our world of sentiment the fragrant atmosphere in which love delights.

2

That is why I love above all the simplest, the commonest, the oldest and the most antiquated: those which have a long human past behind them, a large array of kind and consoling actions; those which have lived with us for hundreds of years and which form part of ourselves, because they put something

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of their grace, something of their gaiety into the souls of our ancestors.

But where do they hide themselves? They are becoming rarer than those which we call rare flowers to-day. They lead a secret and precarious existence. It seems as though we were on the point of losing them; and perhaps there are some which, discouraged at last, have lately disappeared, of which the seeds have died under old ruins, which will never again know the dew of the gardens and which we shall find only in very ancient books, on the bright grass-plots of azure miniatures or along the saffron-tinted lawns of the Primitives.

They are driven from the borders and the flaunting flower-beds by arrogant strangers from Peru, the Cape, China, Japan. They have two pitiless enemies in particular. The first of these is the crowding and prolific *Begonia Tuberosa*, that swarms in the beds like a tribe of turbulent fighting-cocks, with innumerable combs. It is handsome, but insolent and a little artificial; and, whatever the silence and meditation of the hour, under the sun and under the moon, in the intoxication of the day and the solemn peace of the night, it sounds its clarion and proclaims a monotonous, gaudy and scentless victory. The other is the Double Geranium, not quite so indiscreet, but

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indefatigable also and extraordinarily courageous. It would appear desirable were it less lavish. These two, with the help of a few craftier strangers and of the plants with coloured leaves that form those swollen mosaics which at present spoil the fair lines of most of our lawns, these two have gradually ousted their native sisters from the spots which these had so long brightened with their familiar smiles. They no longer have the right to receive the guest with artless little cries of welcome at the gilded gates of the mansion. They are forbidden to prattle near the steps, to twitter in the marble vases, to hum their tune around the fountains, to lisp their dialect along the borders. A few of them have been relegated to the kitchen-garden, in the neglected, but delightful corner occupied by the aromatic plants and simples: the Sage, the Tarragon, the Fennel and the Thyme, old retainers, they too dismissed from service and merely pensioned through a sort of pity or mechanical tradition. Others have taken refuge by the stables and the coach-house, near the low door of the kitchen or the cellar, where they crowd humbly like importunate beggars, hiding their bright dresses among the weeds and holding in their timid perfumes as best they may, so as not to attract attention.

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But, even there, the Pelargonium, red with indignation, and the Begonia, crimson with rage, came to surprise and hustle the unoffending little band; and they fled to the farms, the graveyards, the little gardens of the rectories, of the old maids' houses and of the country convents. And now hardly anywhere, save in the oldest forgotten villages around tumble-down cottages, far from the railways and the nursery-gardener's overweening hot-houses, do we find them again with their natural smile: not wearing a driven, panting and hunted look, but peaceful, calm, restful, plentiful, careless and at home. And, as in former times, in the coaching days, from the top of the stone wall that surrounds the house, through the rails of the white fence or from the sill of the windows enlivened by a caged bird, on the motionless road where none passes save the eternal forces of life, they see Spring come and Autumn, rain and sun, the butterflies and the bees, silence and darkness, followed by the light of the moon.

3

Brave old flowers! Wall-flowers, Gillyflowers, King-cups, Stocks! For, even as the wild flowers, from which a trifle, a ray of beauty, a drop of perfume, divides them, they

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have charming names, the softest in the language; and each of them proudly bears three or four, like so many tiny, simple ex-votos, or so many medals bestowed by the gratitude of men. You Gillyflowers, who sing among the crumbling walls and brighten the sorrowing stones; you Garden Primroses, Primulas or Cowslips, Hyacinths, Crocuses and Cinerarias, Crown Imperials, Scented Violets, Lilies of the Valley, Forget-me-nots, Daisies and Periwinkles, Poet's Narcissus, Pheasant's-Eyes, Bear's-Ears, Alyssum, Lady's Cushions, Anemones: it is through you that the months that come before the leaf-time—February, March, April—translate into smiles which men can understand the first tidings and the first mysterious kisses of the sun! You are frail and chilly and yet as brazen as a happy thought. You make young the grass; you are fresh as the water that flows in the azure cups which the dawn distributes over the greedy buds, ephemeral as the dreams of a child, almost wild still and almost spontaneous, yet already marked by the too-precocious brilliancy, the too-flaming nimbus, the too-pensive grace that overwhelm the flowers which yield obedience to man.

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multuous, drunk with dawns and noons, come the luminous dancing bands of Summer's daughters! Young maidens with white veils and elderly spinsters in violet ribbons, school-girls home for the holidays, first-communicants, pale nuns, dishevelled romps, gossips and prudes. Here is the Marigold, who breaks the green of the borders with her brightness. Here is the Chamomile, like a nosegay of snow, beside her unwearying brothers, the Garden Chrysanthemums, whom we must not confuse with the Japanese Chrysanthemums of Autumn. The Annual Helianthus, or Sunflower, towers like a priest raising the monstrance over the lesser folk in prayer and strives to resemble the orb which he adores. The Poppy exerts himself to fill with light his cup torn by the morning wind. The rough Larkspur, in his peasant's smock, who thinks himself more beautiful than the sky, looks down upon the Dwarf Convolvulus, who reproach him spitefully with putting too much blue into the azure of his flowers. The Virginia Stock, arch and demure in her gown of jaconet, like the little servant-maids of Dordrecht or Leyden, seems to wash the borders of the beds with innocence. The Mignonette hides herself in her laboratory and silently distils perfumes which give us a foretaste of the air that is breathed on the threshold



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of Paradise. The Peonies, who have drunk their imprudent fill of the sun, burst with enthusiasm and bend forward to meet the coming apoplexy. The Scarlet Flax traces a blood-stained furrow that guards the walks; and the Portulaca, or Sun-plant, the wealthy cousin of the Purslane, creeping like a moss, studies to cover with mauve, amber or pink taffeta the soil that has remained bare at the foot of the tall stalks. The chub-faced Dahlia, a little round, a little stupid, carves out of soap, lard or wax his stiff and formal pompons, which will be the ornament of the village holiday. The old, paternal Phlox, standing amid the clusters, lavishes the loud laughter of his jolly, easy-going colours. The Mallows, or Lavateras, like demure misses, feel the pale pink of mantling blushes mount to their corollas at the slightest breath. The Nasturtium paints his water-colours, or screams like a parakeet climbing the bars of its cage; and the Garden Mallow, *Althæa Rosea*, Hollyhock, Jacob's Rod, riding the high horse of her many names, flaunts her cockades of a flesh silkier than a maiden's breasts. The Snapdragon and the almost transparent Balsam are more timorous and awkward and fearfully press their flowers against their stalks.

Next, in the discreet corner of the old families, are

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crowded the Long-leaved Veronica; the Red Potentilla; the African Marigold; the ancient *Lychnis*, or Bachelor's Button; the Mournful Widow, or Purple Scabious; the Foxglove, or *Digitalis*, who shoots up like a melancholy rocket; the European *Aquilegia*, or Columbine; the *Viscaria*, who, on a long, slim neck, lifts a small ingenuous, quite round face to admire the sky; the lurking Honesty, who secretly manufactures "Pope's money," those pale, flat crown-pieces wherewith, no doubt, the elves and fairies by moonlight carry on their trade in spells; lastly, the Pheasant's-Eye the red Valerian, or Jupiter's-Beard, the Sweet William and the old Carnation, that was cultivated long ago by the Grand Condé in his exile.

Beside these, above, all around, on the walls, in the hedges, among the arbours, along the branches, like a crowd of frolicking monkeys and birds, the climbing plants make merry, perform feats of gymnastics, play at swinging, at losing and recovering their balance, at falling, at flying, at looking into space, at reaching beyond the tree-tops to kiss the sky. Here we have the Scarlet Runner and the Sweet Pea, quite proud at being no longer included among the vegetables; the modest *Convolvulus*; the Honeysuckle, whose scent represents the soul of the dew; the Clematis and the Wistaria; while, at

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the windows, between the white curtains, along the stretched string, the *Campanula*, surnamed *Pyramidalis*, works such miracles, throws out sheaves and twists garlands formed of a thousand uniform flowers so prodigiously immaculate and transparent that they who see it for the first time, refusing to believe their eyes, want to touch with their finger the bluey marvel, cool as a fountain, pure as a spring, unreal as a dream.

Meanwhile, in a cluster of sunbeams, the great white Lily, the old lord of the gardens, the only true prince among all the commonalty issuing from the kitchen-garden, the ditches, the copses, the pools and the moors, among the strangers come from none knows where, with his invariable six-petalled silver chalice, whose patent of nobility dates back to that of the gods themselves: the immemorial Lily raises his ancient sceptre, august, inviolate, which creates around it a zone of chastity, silence and light.

5

I have seen them, those whom I have named and as many whom I have forgotten, all thus collected in the garden of an old sage, the same that taught me to love the bees. They displayed themselves in flower-plots and beds, in symmetrical

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borders, ellipses, oblongs, quincunxes and lozenges, surrounded by box hedges, red bricks, delft tiles, like precious things contained in ordered receptacles similar to those which we find in the discoloured engravings that illustrate the works of the old Dutch poet, Jacob Cats, or of good Abbot Sanderus, who, about the middle of the seventeenth century, drew and described in his *Flandria Illustrata* all the country-seats of Flanders and never failed to show his gratitude by topping with a magnificent plume or bush of smoke the chimneys of those great manor-houses where he considered the hospitality generous and approved of the good cheer. And so the flowers were drawn up in rows, some according to their kinds, others according to their shapes and shades, while others, lastly, mingled, according to the ever happy chances of the wind and sun, the most hostile and murderous colours, in order to show that nature acknowledges no dissonance and that all that lives creates its own harmony.

From its twelve rounded windows, with their glittering panes, their muslin curtains, their broad green shutters, the long, painted house, pink and gleaming as a shell, watched them wake at dawn and throw off the brisk diamonds of the dew and close at night under the blue darkness that falls from

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the stars. One felt that, solidly planted between two clear ditches that lost themselves in the distance of the immense pasturage dotted with motionless cows, the house took an intelligent pleasure in this gentle daily fairy-play, while, by the roadside, a proud mill, bending forward like a preacher, made familiar signs with its paternal sails to the passers-by from the village.

6

Has this earth of ours a fairer ornament of its hours of leisure than the care of flowers? It was beautiful to see thus collected for the pleasure of the eyes, around the dwelling of my placid friend, the splendid throng that distils the light to extract from it marvellous colours, honey and perfumes. He found there translated into visible and positive joys, at the gates of his house, the scattered, fleeting and almost intangible delights of Summer: the voluptuous air, the balmy nights, the shimmering sunbeams, the glad hours, the confidences of the dawn, the whispering intentness of the azure space. He enjoyed not only their dazzling presence; he also hoped—probably unwisely, so deep and vague is that mystery—he also hoped, by dint of questioning them, to surprise, with their aid, I know not what secret law or idea of nature, I know not what

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essential thought of the universe, which perhaps betrays itself in those ardent moments wherein it strives to please other beings, to beguile other lives and to create beauty. . . .

7

Old-fashioned flowers, I said. I was wrong; for they are not so old. When we study their history and investigate their pedigrees, we learn with surprise that most of them, down to the simplest and commonest, are newcomers, freedmen, exiles, upstarts, visitors, foreigners. Any botanical treatise will reveal their origins. The Tulip, for instance (remember La Bruyère's "Solitary," "Oriental," "Agate" and "Cloth of Gold"), came from Constantinople in the sixteenth century. The Buttercup, the Moonwort, or Honesty, the Caltrop, the Balsam, the Fuchsia, the African Marigold, or *Tagetes Erecta*, the Rose Campion, or *Lychnis Coronaria*, the Variegated Wolf's-bane, the *Amarantus Caudatus*, or Love-lies-bleeding, the Hollyhock and the *Campanula Pyramidalis* arrived at about the same time from the Indies, Mexico, Persia, Syria or Italy. The Pansy appears in 1613; the Yellow Alyssum in 1710; the Scarlet Flax in 1819; the Purple Scabious in 1629; the Chinese Saxifrage in 1771; the Long-

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leaved Veronica in 1731. The Perennial Phlox is a little older. The China Pink made her entrance into our gardens about the year 1713. The Garden Pink is of modern date. The Flowering Purslane did not make her appearance till 1828; the Scarlet Sage till 1822. The Ageratum, now so plentiful and so popular, is not two centuries old. The Elichrysum, or Xeranthemum, is even younger. The Zinnia is just a centenarian. The Scarlet Runner, a native of South America, and the Sweet Pea, an immigrant from Sicily, number a little over two hundred years. The Chamomile, whom we find in the least-known village, has been cultivated only since 1699. The charming Blue Lobelia of our borders came to us from the Cape of Good Hope at the time of the French Revolution. The China Aster, or *Reine Marguerite*, is dated 1731. The Annual or Drummond's Phlox, now so common, was sent over from Texas in 1835. The Large-flowered Lavatera, or Tree-Mallow, who looks so confirmed a native, so simple a rustic, has blossomed in our northern gardens only since two centuries and a half; and the Petunia since some twenty lustres. The Mignonette, the Heliotrope—who would believe it?—are not two hundred years old. The Dahlia was born in 1802; and the Gladiolus and Gloxinia are of yesterday.

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8

What flowers, then, blossomed in the gardens of our fathers? They were very few, no doubt, and very small and very humble, scarce to be distinguished from those of the roads, the fields and the glades. Have you ever observed the poverty and the monotony, most skilfully disguised, of the floral decoration of the finest miniatures in our old manuscripts? Again, the pictures in our museums, down to the end of the Renaissance period, have only five or six types of flowers, incessantly repeated, wherewith to enliven the richest palaces, the most marvellous views of Paradise. Before the sixteenth century, our gardens were almost bare; and, later, Versailles itself, Versailles the splendid, could have shown us only what the poorest village shows to-day. Alone, the Violet, the Daisy, the Lily of the Valley, the Marigold, the Poppy, a few Crocuses, a few Irises, a few Colchicums, the Foxglove, the Valerian, the Larkspur, the Cornflower, the Wild Pink, the Forget-me-not, the Gillyflower, the Mallow, the Rose, still almost a Sweetbriar, and the great silver Lily, the spontaneous ornaments of our woods and of our snow-frightened, wind-frightened fields: these alone smiled upon our forefathers, who, for that matter, were unaware of their

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poverty. Man had not yet learnt to look around him, to enjoy the life of nature. Then came the Renaissance, the great voyages, the discovery and the invasion of the sunlight. All the flowers of the world, the successful efforts, the deep, inmost beauties, the joyful thoughts and wishes of the planet rose up to us, borne on a shaft of light that, in spite of its heavenly wonder, issued from our own earth. Man ventured forth from the cloister, the crypt, the town of brick and stone, the gloomy stronghold in which he had slept. He went down into the garden, which became peopled with bees, purple and perfumes; he opened his eyes, astounded like a child escaping from the dreams of the night; and the forest, the plain, the sea and the mountains and, lastly, the birds and the flowers, that speak in the name of all a more human language which he already understood, greeted his awakening.

9

Nowadays, perhaps, there are no undiscovered flowers. We have found all or nearly all the forms which nature lends to the great dream of love, to the yearning for beauty that stirs within her bosom. We live, so to speak, in the midst of her tenderest confidences, of her most touching inventions. We

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take an unhoped-for part in the most mysterious festivals of the invisible force that animates us also. Doubtless, in appearance, it is a small thing that a few more flowers should adorn our beds. They only scatter a few impotent smiles along the paths that lead to the grave. It is none the less true that these are new smiles, which were unknown to those who came before us; and this recently-discovered happiness spreads generously in every direction, even to the doors of the most wretched hovels. The good, the simple flowers are as happy and as gorgeous in the poor man's strip of garden as in the broad lawns of the great house; and they surround the cottage with the supreme beauty of the earth: for the earth has hitherto produced nothing more beautiful than the flowers. They have completed the conquest of the globe. Foreseeing the days when men shall at last have long and equal leisure, already they promise an equality in healthy enjoyment. Yes, assuredly it is a small thing; and everything is a small thing, if we look at each of our little victories one by one. It is a small thing, too, in appearance, that we should have a few more thoughts in our heads, a new feeling at our hearts; and yet it is just that which is slowly leading us where we hope to arrive.

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After all, we have here a very real fact, namely, that we live in a world in which flowers are more beautiful and more numerous than formerly; and perhaps we have the right to add that the thoughts of men are now more just and greedier of truth. The smallest joy gained and the smallest grief conquered should be marked in the Book of Humanity. It behoves us not to lose sight of any of the evidence that we are mastering the nameless powers, that we are beginning to wield some of the laws that govern creation, that we are making our planet our home, that we are adorning our stay and gradually broadening the acreage of happiness and of beautiful life.

THE WRATH OF THE BEE

THE WRATH OF THE BEE

V

SINCE the publication of *The Life of the Bee*, I have often been asked to throw light upon one of the most dreaded mysteries of the hive, namely, the psychology of its inexplicable, sudden and sometimes mortal wrath. A host of cruel and unjust legends still hovers round the abode of the yellow fairies of the honey. The bravest among the guests who visit the garden slacken their pace and lapse into involuntary silence as they approach the enclosure, blossoming with melilot and mignonette, where buzz the daughters of the light. Doting mothers keep their children away from it, as they would keep them away from a smouldering fire or a nest of adders; nor does the bee-keeping novice, gloved in leather, veiled in gauze, surrounded by clouds of smoke, face the mystic citadel without that little unavowed shiver which men feel before a great battle.

How much sense is there at the back of these traditional fears? Is the bee really dangerous? Does she allow herself to be tamed? Is there a risk in approaching the hives?

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Ought we to flee or to face their wrath? Has the bee-keeper some secret or some talisman that preserves him from being stung? These are the questions that are anxiously put by all who have started a timid hive and who are beginning their apprenticeship.

2

The bee, in general, is neither ill-disposed nor aggressive, but appears somewhat capricious. She has an unconquerable antipathy to certain people; she also has her nervous days—for instance, when a storm is gathering—days on which she shows herself extremely irritable. She has a most subtle and delicate sense of smell; she tolerates no perfume and detests, above all, the scent of human sweat and of alcohol. She is not to be tamed, in the proper sense of the word; but, whereas the hives which we seldom visit become crabbed and distrustful, those which we surround with our daily cares soon grow accustomed to the discreet and prudent presence of man. Lastly, to enable us to handle the bees almost with impunity, there exist a certain number of little expedients, which vary according to circumstances and which can be learnt by practice alone. But it is time to reveal the great secret of their wrath.

DISTURBED



THE WRATH OF THE BEE

3

The bee, essentially so pacific, so forbearing, who never stings (unless you touch her) when looting among the flowers, the bee, once she has returned to her kingdom with the waxen monuments, either retains her mild and tolerant character, or grows violent and deadly dangerous, according as her maternal city be opulent or poor. Here again, as often happens when we study the manners of this spirited and mysterious little people, the previsions of human logic are utterly at fault. It were but natural that the bees should defend desperately treasures so laboriously amassed, a city such as we find in good apiaries, where the nectar, overflowing the numberless cells that represent thousands of casks piled from cellar to garret, streams in golden stalactites along the rustling walls and sends far afield, in glad response to the ephemeral perfumes of calyces that are opening, the more lasting perfume of the honey that keeps alive the memory of calyces which time has closed. Now this is not the case. The richer their abode, the less eagerness do they show to fight round about it. Open or overturn a wealthy hive: if you take care to drive the sentries from the entrance with a whiff of tobacco smoke, it will be extremely

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rare for the other bees to contend with you for the liquid booty conquered from the smiles, from all the charms of the fair azure months. Try the experiment: I promise you impunity, if you touch only the heavier hives. You can turn them over and empty them like so many quivering, but harmless jars. What does it mean? Have the fierce amazons lost courage? Has abundance unmanned them; and have they, after the manner of the too-fortunate inhabitants of luxurious towns, delegated the dangerous duties to the wretched mercenaries that keep watch at the gates? No, it has never been observed that the greatest good-fortune relaxes the valour of the bee. On the contrary, the more the republic prospers, the more harshly and severely are its laws applied; and the worker in a hive where superfluity accumulates labours much more zealously than her sister in an indigent hive. There are other reasons which we cannot wholly fathom, but which are likely reasons, if only we take into account the wild interpretation which the poor bee must needs place upon our monstrous doings. Seeing suddenly her huge dwelling-place upheaved, overturned, half-opened, she probably imagines that an inevitable, a natural catastrophe is occurring against which it were madness to struggle. She no longer resists, but neither

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does she flee. It looks as though, accepting the devastation, already, in her instinct, she saw the future dwelling which she hopes to build with the materials taken from the gutted town. She leaves the present defenceless in order to save the hereafter. Or else, perhaps, does she, like the dog in the fable, "the dog that carried its master's dinner round its neck," knowing that all is irreparably lost, prefer to die taking her share of the pillage and to pass from life to death in one prodigious orgy? We do not know for certain. How should we penetrate the motives of the bee, when those of the simplest actions of our brothers are beyond our ken?

4

Still, the fact is that, at each great proof to which the city is put, at each trouble that appears to the bees to possess an inevitable character, no sooner has the infatuation spread from one to the other among the dense and quivering crowd than the bees fling themselves upon the combs, violently tear the sacred lids from the winter provisions, topple head foremost and plunge their whole bodies into the sweet-smelling vats, imbibe with long draughts the chaste wine of the flowers, gorge themselves with it, intoxicate themselves with it, till

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their bronze-ringed bellies stretch and swell like strangled leather bottles. Now the bee, when bursting with honey, can no longer curve her abdomen at the requisite angle to unsheathe her sting. She becomes, so to speak, mechanically harmless from that moment. It is generally imagined that the bee-keeper employs the fumigator to stupefy, to half-asphyxiate the warriors that gather their treasure in the blue and thus, under favour of a defenceless slumber, to effect an entrance into the palace of the innumerable sleeping amazons. This is a mistake: the smoke serves first to drive back the guardians of the threshold, who are ever on the alert and extremely combative; then, two or three whiffs come to spread panic among the workers: the panic provokes the mysterious orgy and the orgy helplessness. Thus is the fact explained that, with bare arms and unprotected face, one can open the most populous hives, examine their combs, shake off the bees, spread them at one's feet, heap them up, pour them out like grains of corn and quietly collect the honey, in the midst of the deafening cloud of evicted workers, without incurring a single sting.

But woe to whoso touches the poor hives! Keep away

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from the abodes of want! Here, smoke has lost its spell; and you shall scarce have emitted the first whiffs before twenty thousand vicious and frenzied demons will dart from within the walls, overwhelm your hands, blind your eyes and blacken your face. No living being, except, they say, the bear and the Sphinx Atropos, can resist the rage of the mailed legions. Above all, do not struggle: their fury would seize the neighbouring colonies; and the smell of discharged venom would incense all the republics around. There is no means of safety other than instant flight through the bushes. The bee is less rancorous, less implacable than the wasp and rarely pursues her enemy. If flight be impossible, absolute immobility alone might calm her or put her off. She is frightened by and resents any too sudden movement, but at once forgives that which no longer stirs.

The poor hives live, or rather die, from day to day; and it is because they have no honey in their cellars that smoke makes no impression on the bees. They cannot gorge themselves like their sisters that belong to more prosperous communities; the possibilities of a future city are not there to divert their ardour. Their only thought is to perish on the outraged threshold, and, lean, shrunk, agile, rabid, they defend it with

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unparalleled and desperate heroism. Therefore the cautious bee-keeper never displaces the indigent hives without making a preliminary sacrifice to the hungry Furies. His offering is a honey-comb. They hasten up and then, the smoke assisting, they distend and intoxicate themselves: behold them reduced to helplessness like the rich burgesses of the well-filled cells.

6

One could find much more to tell of the wrath of the bees and of their singular antipathies. These antipathies are often so strange that they were long attributed—and are still attributed by the peasantry—to moral causes, to profound and mystic intuitions. There is the conviction, for instance, that the vestal vintagers cannot endure the approach of the unchaste, above all of the adulterous. It would be surprising if the most rational beings that live with us on this incomprehensible globe were to attach so much importance to a trespass that is often very harmless. In reality, they give it no thought; but they, whose whole life sways to the nuptial and sumptuous breath of the flowers, abhor the perfumes which we steal from them.

Are we to believe that chastity exhales fewer odours than

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love? Is this the origin of the rancour of the jealous bees and of the austere legend that avenges virtues as jealous as they? Be this as it may, the legend must be classed with the many others that pretend to do great honour to the phenomena of nature by ascribing human feelings to them. It would be better, on the contrary, to mix our petty human psychology as little as possible with all that we do not easily understand, to seek our explanations only without, on this side of man or on that side; for it is probably there that lie the decisive revelations which we are still awaiting.

THE END

